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FLAHERTY-GIAVARA ASSOCIATES NEW HAVEN CT
NATIONAL DAM SAFETY PROGRAM. LITTLE CHOCONUT WATERSHED SITE 2A --ETC(U)
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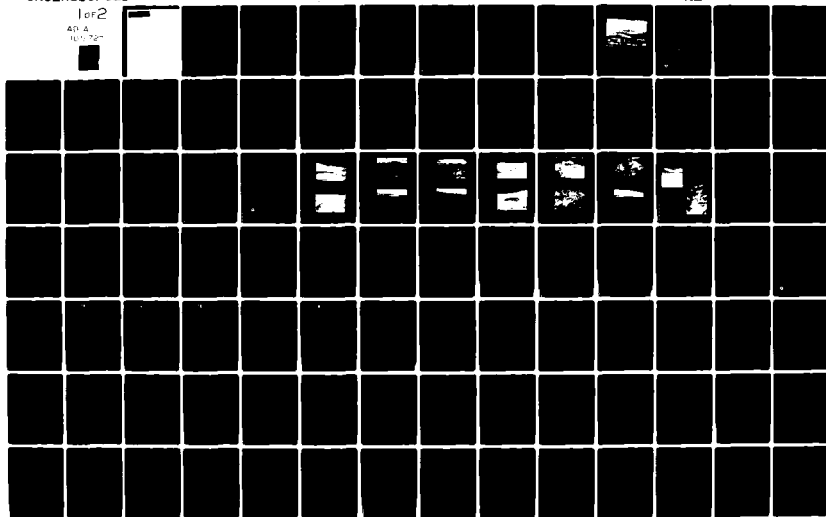
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18. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some minor deficiencies that need to be remedied.		

Hydrologic/hydraulic analyses performed in accordance with the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams indicate that the principal spillway and the emergency spillway would pass 100 percent of the outflow from the Probable Maximum Flood (PMF) without overtopping the dam. Therefore, the combined spillway capacity is adjudged to be adequate.

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
LITTLE CHOCONUT WATERSHED SITE 2A DAM
INVENTORY NO. NY 720
SUSQUEHANNA RIVER BASIN
BROOME COUNTY, NEW YORK

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Little Choconut Watershed Site 2A Dam
State Located: New York
County: Broome
Watershed: Susquehanna River Basin
Stream: Unnamed Tributary of Little Choconut Creek
Date of Inspection: December 15, 1980

ASSESSMENT

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some minor deficiencies that need to be remedied.

Hydrologic/hydraulic analyses performed in accordance with the Corps of Engineers' Recommended Guidelines for Safety Inspection of Dams indicate that the principal spillway and the emergency spillway would pass 100 percent of the outflow from the Probable Maximum Flood (PMF) without overtopping the dam. Therefore, the combined spillway capacity is adjudged to be adequate.

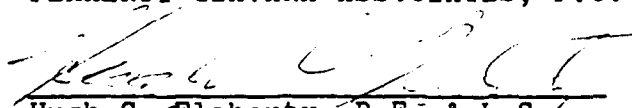
The dam has only minor deficiencies. The following corrective measures should be completed within 12 months from the final approval date of this report:

1. Repair local erosion gullies along the left side of the spillway outlet channel.
2. Mow the vegetation on the slopes of the embankment and emergency spillway channel annually.
3. Control access and foot traffic, taking necessary measures to prevent erosion.
4. Remove cattails in front of drop inlet structure and along the toe of the upstream slope.
5. Remove the barbed wire fence stretching across the entrance to the approach channel of the emergency spillway.

In the interim, develop a flood warning and emergency evacuation plan to alert the public in the event conditions occur which could result in failure of the dam.

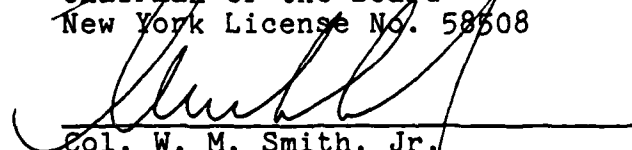
Submitted by:

FLAHERTY GIAVARA ASSOCIATES, P.C.



Hugh C. Flaherty, P.E. & L.S.
Chairman of the Board
New York License No. 58508

Approved by:



Col. W. M. Smith, Jr.
New York District Engineer

Date:

30 JUN 1981



PHOTO #1: Overview of
Little Choconut Watershed Site 2A Dam
Inventory No. NY 720

NATIONAL DAM SAFETY PROGRAM
PHASE I INSPECTION REPORT
LITTLE CHOCONUT WATERSHED SITE 2A DAM
INVENTORY NO. NY 720
D.E.C. NO. 96A-3628
SUSQUEHANNA RIVER BASIN
BROOME COUNTY, NEW YORK

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I Inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367. Flaherty Giavara Associates, P.C. has been retained by the New York District to inspect and report on selected dams in the State of New York. Authorization and notice to proceed was issued to Flaherty Giavara Associates, P.C. under a letter of December 24, 1980 from W. M. Smith, Jr. Colonel, Corps of Engineers. Contract No. DACW 51-81-C-0006 has been assigned by the Corps of Engineers for this work.

b. Purpose

Evaluation of the existing conditions of the subject dam to identify deficiencies and hazardous conditions, determine if they constitute hazards to life and property and recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

Little Choconut Watershed Site 2A Dam consists of an earthen embankment with a concrete pipe principal spillway under the right side of the embankment and a vegetated emergency spillway channel cut into the left abutment. It is one of eight floodwater retarding dams in the Little Choconut, Finch Hollow, and Trout Brook watersheds designed to reduce floodwater damages. Plans, profiles and sections prepared for the project by the U.S. Department of Agriculture, Soil Conservation Service (SCS), are shown on drawings in Appendix F.

The dam embankment is approximately 530 feet long, 33 feet high and has an upstream slope of 3 horizontal to 1 vertical and a downstream slope of 2.5 to 1. The crest of

the dam is 14 feet in width and its elevation varies from 1156.6 to 1157.4 (NGVD). There is a 10 foot wide berm at the toe of the upstream slope just below normal pond level. The embankment has a homogeneous cross section of compacted glacial till and a 12 to 16 foot wide cutoff of the same material extending 5 to 10 feet below the original ground surface into a foundation primarily of glacial till and glacial lacustrine material over bedrock and extending to rock under the right abutment slope. The upstream and downstream slopes are provided with grass cover (crown vetch) for erosion protection. Riprap is in place around the principle spillway outlet. The embankment has an internal drain constructed in pervious fill located near the downstream toe of slope. Two 8 inch diameter perforated bituminous-coated corrugated metal pipes are embedded in the pervious fill to drain the embankment and they discharge at both sides of the principal spillway outlet.

- The principal spillway is a drop inlet structure consisting of a single stage reinforced concrete riser, a 24 inch diameter prestressed concrete cylinder pipe (PCCP) and a channel excavated into bedrock at the outlet of the conduit.

The emergency spillway is a curved 80 foot wide channel with 3 to 1 side slopes cut into earth at the left abutment. It is about 650 feet long, extending below the dam in a fill section. The emergency spillway slopes gently downward both upstream and downstream from a 30 foot wide level section (the spillway crest) that is in the vicinity of the left side of the dam crest. Approximately 270 feet of the right channel slope is formed by a spur dike which has a 12 foot crest that varies in elevation from 1148.2 to 1156.6 (NGVD). The channel bottom and side slopes of the emergency spillway and the slopes and crest of the spur dike are vegetated.

b. Location

The Little Choconut Watershed Site 2A Dam is located off East Maine Road approximately 0.7 miles northwest of Choconut Center in the Town of Union, New York. The dam is located at latitude north 42°-08.8' and longitude west 75°-57.4' on the U.S. Geological Survey 7.5 minute series topographic map "Castle Creek, New York". The Location Map on page i indicates where the dam is situated.

c. Size Classification

The maximum height of the dam is 33 feet and the maximum storage capacity is 192 acre-feet at the design high water elevation. Therefore, the Little Choconut Water-

shed Site 2A Dam is classified as a "Small" dam as defined by the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

There are approximately 8 dwellings within the dam failure flood hazard area. East Maine Road, Airport Road and Stella Ireland Road are located downstream of the dam. Therefore, the dam is in the High Hazard category as defined by the Recommended Guidelines for Safety Inspection of Dams.

e. Ownership

The dam is owned by the County of Broome and maintained by the Broome County Soil & Water Conservation District. Their addresses and telephone numbers are as follows:

Owner

Contact: Carl S. Young, Broome County Executive
Broome County Building
Government Plaza
P.O. Box 1766
Binghamton, New York 13902

Telephone: (607) 772-2109

Maintenance

Contact: Mr. William Maxian, District Manager
Broome County Soil & Water Conservation
District
Farm, Home & 4-H Center
840 Front Street
Binghamton, New York 13905

Telephone: (607) 773-2691

f. Purpose

The primary purpose of this dam is flood control in the Little Choconut Creek watershed to reduce floodwater damages.

g. Design and Construction History

The dam was designed by the Soil Conservation Service (SCS), of the U.S. Department of Agriculture (USDA) in 1965 and 1966. It was constructed by Les Strong Inc. of Whitney Point, New York in 1968. No major post construction modifications have been made to the dam.

h. Normal Operating Procedure

The intake riser is always open; therefore, the water level is maintained at the elevation of the crest of the intake orifice for normal flows. There are no regular operating procedures.

1.3 PERTINENT DATA

a. Drainage Area (Square Miles) 0.63

b. Discharge at Dam Site (CFS)

- Top of Dam	3660
- Crest of Emergency Spillway	20
- Crest of Principal Spillway	2
- Reservoir Drain Inlet	-

c. Elevations (NGVD)

- Top of Dam	1156.6
- Design High Water Level	1151.7
- Crest of Emergency Spillway	1149.9
- Crest of Principal Spillway	1136.8
- Reservoir Drain Inlet	1131.0

d. Reservoir Surface Area (Acres)

- Top of Dam	24.3
- Design High Water Level	20.6
- Crest of Emergency Spillway	19.2
- Crest of Principal Spillway	4.0

e. Storage (Acre-Feet)

- Top of Dam	302
- Design High Water Level	192
- Crest of Emergency Spillway	155
- Crest of Principal Spillway	8

f. Dam

- Type: Homogeneous compacted glacial till with a glacial till cutoff	
- Crest Length (Feet)	530
- Upstream Slope (H:V)	3:1
- Downstream Slope (H:V)	2.5:1
- Crest Width (Feet)	14

g. Emergency Spillway

- Type: Excavated earthen channel;
right bank is part of spur dike
- Length (Feet) 650
- Bottom Width (Feet) 80
- Side Slopes (H:V) 3:1
- Channel Bottom Slopes (Feet/Foot)
 - upstream 0.010
 - downstream 0.033

h. Principal Spillway

- Type: Drop inlet structure consisting of a single stage reinforced concrete riser, a 24 inch diameter prestressed concrete cylinder pipe (163 feet long) and a channel excavated into bedrock at the outlet end of the conduit

- Control: None

i. Reservoir Drain

- Type: 6 inch diameter cast iron mechanical joint pipe (25 feet long) having a trash rack and concrete pad and draining into the reinforced concrete riser

- Control: 6 inch flat frame slide gate located at the inlet to the reinforced concrete riser

j. Toe Drain

- Type: Two 8 inch diameter perforated bituminous-coated corrugated metal pipes in pervious fill

- Control: None

SECTION 2 - ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Little Choconut Watershed Site 2A Dam is located in the Appalachian Plateau physiographic province of New York State.

The topography in the area ranges from an elevation of 800 feet in the Susquehanna River to 1600 feet on some of the higher hills. Glacial action, while not having a greatly modifying effect on the topography, has had a smoothing tendency. Glacial lacustrine deposits in the valleys have decreased the pre-glacial relief. Scour and ablation of the ridge tops was slight, as the ice sheet was thin in this area. The outer limit of continental glaciation was only about 40 miles south of Binghamton.

The underlying bedrock is Upper Devonian in age and is almost exclusively shales and siltstones of the Catskill Delta. This site is situated on the southeast limb of the Horseheads Syncline. This syncline is one of a series of gently undulating folds that trend west and then southwest across the southern tier of counties in New York State. They are related to the intensely folded belt of the Appalachians and gradually disappear as a series of low, gentle swells to the north.

Historically, the site appears to have experienced some glacial scour of the valley bottom and southwest abutment. Subsequent melt waters deposited silts and clays in the valley bottom. These probably represent a northwesterly extension of a glacial lake formed in the Chocunut and Susquehanna valleys. Till, associated with the glacial advance, mantles the rest of the site.

b. Subsurface Investigations

1. Centerline of Dam

The left abutment of this site is a fairly uniform, dense glacial till down to the vicinity of DH (drill hole) 51 (see Appendix F - Profiles). At this location, the till is underlain by silts and clays of relatively low density.

In the floodplain, the till is apparently absent in the upper section of the profile. (The presence of impounded water prevented any drilling in a section

approximately 160 feet in length along the centerline.

In the lower right abutment, the silts and clays are present in the entire profile down to a depth of 20 feet. Higher up the abutment, bedrock is within 6 or 7 feet of the surface and is overlain by till. At elevations above the top of the dam, the bedrock appears to be at or near the surface.

There were no materials encountered along the centerline that would be considered permeable.

The bedrock in the right abutment is an interbedded siltstone and shale. The upper two feet or so is weathered to a moderate degree. The column in general shows about 80% bedded 1 to 3 inches thick and fairly soft. The remaining 20% is an average 4 to 6 inches thick and considerably more competent. A set of joints oriented approximately north-south is well developed in this area. An east-west set is less well developed.

The bedrock surface drops off very steeply under the floodplain to an unknown depth.

2. Principal Spillway

Bedrock underlies the centerline of the principal spillway at varying depths ranging from 5.7 feet to 10.5 feet.

The material overlying the bedrock is approximately 4 feet of silt and 4 feet of clay at the location of TP (test pit) 301. Downstream toward the centerline of dam and the outlet structure, these materials grade into a mixture of alluvial and lacustrine deposits.

3. Emergency Spillway

The emergency spillway excavation is entirely in a fairly uniform glacial till. Bedrock was not encountered in any of the test pits, some of which were carried to 3 feet below design grade.

Several sandy streaks were noted in this till, and a minor amount of seepage was present in these sands.

2.2 DESIGN RECORDS

This dam was designed by the SCS in 1965 and 1966. As part of the design process, a design report, a geology report and soils testing were completed for the site. This data is in-

cluded in Appendix D.

2.3 CONSTRUCTION RECORDS

This dam was constructed in 1968 by Les Strong, Inc. of Whitney Point, New York. The contract drawings which were prepared by the SCS have been updated to reflect "As-Built" conditions and are included in Appendix F. In addition, detailed records kept by the SCS during construction are available at their office in Syracuse, New York.

2.4 OPERATION RECORDS

There were no operation records available for this dam.

2.5 EVALUATION OF DATA

The data presented herein was obtained primarily from the SCS office located in Syracuse, New York and also from the files of the New York State Department of Environmental Conservation (DEC). This information appears to be reliable and adequate for the purposes of a Phase I Inspection Report.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Little Choconut Watershed Site 2A Dam was conducted on December 15, 1980. The weather was overcast and the temperature was 15⁺°F. At the time of this inspection, there was approximately one inch of snow on the ground and water was flowing in the principal spillway outlet pipe (See Photo No. 11).

b. Dam

The earthfill embankment of the dam is generally in good condition. There was no visible evidence of settlement, lateral movement, seepage, major erosion, or other serious defects.

The following specific items were noted:

1. Foot traffic has worn paths along the upstream toe and at several locations on the embankment and channel slopes (See Photos No. 3 and 6). These have not yet significantly eroded.
2. The grass has been cut short on the relatively level surfaces, but is about 18 inches high on the embankment and cut slopes (See Photos No. 3, 4, 5, 6 and 7). However, the absence of brush is indicative of past periodic cutting.
3. There are local erosion gullies and/or small sinkholes along the upper portion of the left side of the spillway outlet channel (See Photo No. 12). These may reflect the composition and placement of waste material that extends along the emergency spillway channel slope to the outlet channel. They did not appear to be an indication of flow in the underlying old streambed. No active seepage was observed.
4. The toe drains were in good condition. The pipe draining the right side of the dam was flowing at a rate of approximately 1+ gallons per minute (GPM) as depicted in Photo No. 15.

c. Principal Spillway

1. Drop Inlet Structure

The reinforced concrete drop inlet is in excellent condition. The inlet orifice was free of debris, and

had a trash rack in front of it. The heavy growth of cattails (See Photo No. 10) in front of the structure should be removed before they grow to obstruct the inlet. The gate stem for the low level drain was observed but not operated during the inspection.

2. Principal Spillway Conduit

The 24 inch diameter prestressed concrete cylinder pipe (PCCP) is in excellent condition where visible. The spillway conduit is vented on the upstream side of the dam (See Photo No. 14).

3. Principal Spillway Outlet

The 24 inch diameter conduit has a projecting end and discharges into a channel excavated into bedrock with a 0.5 foot drop. The riprap around the outlet appeared to be stable and in good condition (See Photo No. 11).

4. Principal Spillway Discharge Channel

The grass-lined channel has an initial width of 10 feet, and narrows slightly in the downstream direction. The side slopes are very steep, and typically 6 to 8 feet high. There are numerous sloughs and evidence of surface erosion on the sides. The banks have a heavy grass cover and a few isolated shrubs (See Photo No. 12). The bed of the channel is controlled by downstream bedrock exposures.

d. Emergency Spillway

The dam has an 80 foot wide earthen spillway excavated into the left abutment. The approach channel, spillway crest, and discharge channel all have a thick, heavy grass cover and are in good condition (See Photos No. 8 and 9).

The approach and discharge channels are separated from the dam embankment by an earthen spur dike, which is in good condition (See Photos No. 4 and 5).

There is a 4 foot high barbed wire fence across the entrance to the approach channel which could collect debris and inhibit flow through the spillway.

There was no evidence of cutoffs. The crest of the emergency spillway appears to slope towards the spur dike, and could concentrate flow on that side.

The discharge channel leads onto a broad spoil area below the dam. This open area slopes toward both the principal spillway discharge channel and the toe of the dam, and could allow water to flow along the toe.

e. Downstream Channel

The natural channel downstream of the dam site has a width of 10 to 20 feet. The streambed appears to have degraded about 2 feet in recent years, but currently appears stable. Bedrock is exposed along the right side of the channel. The bed consists of rock fragments (gravel to cobbles).

f. Reservoir - Storage Pool Area

The floodwater storage area is bordered by gently sloping fields with scattered trees on all except the right side. On the right side a heavily wooded slope steepens considerably at and above the design high water level (See Photos No. 2 and 13). There are no visible signs of instability or sedimentation problems in the reservoir area.

3.2 EVALUATION OF OBSERVATIONS

The visual inspection revealed some minor deficiencies. The following observations were made:

- a. Local erosion gullies were noted in the emergency spillway outlet channel.
- b. The grass was 18+ inches high on the embankment and emergency spillway slopes.
- c. Footpaths were observed along the upstream toe and on the slopes.
- d. Cattails were growing around the drop inlet structure.
- e. A barbed wire fence was observed across the emergency spillway entrance.

Based on the visual examination conducted on December 15, 1980, the Little Choconut Watershed Site 2A Dam is considered to be in good condition. The minor deficiencies which have been observed should not have a serious effect on the performance or safety of the structure.

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface level is maintained by the orifice of the drop inlet structure at elevation 1136.8 (NGVD). No operational procedures are in effect at this time.

4.2 MAINTENANCE OF DAM

The dam is maintained by the Broome County Soil & Water Conservation District. Presently the following yearly maintenance items are performed:

- a. Mowing the dam crest and the bottom of the emergency spillway channel; however, the mowing of the slopes of the embankment and emergency spillway is only done every three years.
- b. Maintenance of riprap.
- c. Maintenance of the trash rack on the drop inlet structure.
- d. Inspection of concrete and pipes.
- e. Inspection of the dam embankment for seepage.
- f. Operation of the gate used to drain the impoundment.
- g. Repairs to fences and roads are made as necessary.

4.3 WARNING SYSTEM

No warning system is now in effect; however, the Broome County Soil & Water Conservation District is in the process of preparing an emergency action plan and warning system for the dam to be implemented in the event of dam failure.

4.4 EVALUATION

The operation and maintenance procedures of the dam and appurtenances are satisfactory. However, increased maintenance efforts are required to correct the minor deficiencies which exist.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The dam is located on an unnamed tributary 4500+ feet upstream of Little Choconut Creek. The unnamed tributary joins Little Choconut Creek near Choconut Center, approximately four miles upstream of the Susquehanna River at Johnson City, New York.

The watershed (shown on the Watershed Map on page C-5 in Appendix C) consists of 406 acres (0.63 square miles) of rolling to hilly uplands with typical slopes of 10 percent. Land use within the watershed is primarily agricultural, with extensive open fields and orchards. There are no significant waterbodies or wetlands upstream of the dam.

The watercourse upon which the dam is located is a small perennial stream with a typical flow width of 10 feet and a typical flow depth of 5 inches.

5.2 ANALYSIS CRITERIA

The purpose of the hydrologic/hydraulic analysis is to evaluate the spillway capacity and the potential for overtopping. The analysis of the spillway capacity of the dam and storage of the reservoir was performed using the Corps of Engineers HEC-1 Computer Model - Dam Safety Version. The procedure included determining the Probable Maximum Flood (PMF) runoff from the watershed and routing the inflow hydrograph through the impoundment to determine the outflow hydrograph. The unit hydrograph was defined by the Snyder Synthetic Unit Hydrograph method, and the Modified Puls routing procedure was incorporated.

The initial rainfall loss was assumed to be 1.0 inches, and the uniform rainfall loss was assumed to be 0.1 inches per hour. In accordance with recommended guidelines of the Corps of Engineers, the Probable Maximum Precipitation (PMP) was 23.5 inches (6 hour duration, 10 square mile area).

The analysis was conducted for both the full PMF and for several fractional PMF conditions. The PMF inflow of 2086 CFS was routed through the reservoir and the peak outflow was determined to be 1990 CFS.

5.3 SPILLWAY CAPACITY

The total outlet capacity is the sum of discharges from the principal spillway and the emergency spillway.

The principal spillway consists of a drop inlet and conduit. Its flow capacity was evaluated by assuming that its capacity

was controlled by the inlet, which acts as an orifice when submerged by water stages more than one foot above its invert. The area of the orifice is 1.2+ square feet, the coefficient of discharge is 0.6, and the centerline elevation is 1137.3 (NGVD).

The emergency spillway is an 80 foot wide trapezoidal-shaped vegetated channel. The SCS design information indicates the emergency spillway was designed to be used only by a flood event with an average return frequency of more than 100 years.

The stage discharge curve for the combined principal and emergency spillways was obtained from the Soil Conservation Service design report for the stages above and including elevation 1149.9 (NGVD) and is tabulated below:

<u>Stage (Feet)</u>	<u>Discharge Capacity (CFS)</u>	<u>Element of Structure</u>
1136.8	0	Sediment Pool
1140.0	9.5	--
1149.9	19.9	Emergency Spillway
1151.7	388	Crest
1156.6	3660	Design High Water Top of Dam

The total spillway capacity at the top of dam is 3660 CFS.

The principal spillway can pass approximately 22 percent of the PMF before use of the vegetated emergency spillway would be required.

The energy grade line of the PMF discharge would be 4.2 feet above the crest of the emergency spillway. The average flow velocity in the emergency spillway discharge channel would be 10.5 feet per second (FPS).

5.4 RESERVOIR CAPACITY

The storage capacity of the reservoir was obtained from the Soil Conservation Service design report, as indicated below:

<u>Stage (Feet)</u>	<u>Storage (Acre-Feet)</u>	<u>Storage (Inches of Runoff)</u>
1136.8	8	0.24
1149.9	155	4.58
1151.7	192	5.67
1156.6	302	8.93

5.5 FLOODS OF RECORD

The maximum floods of record for this dam are summarized below:

<u>Date</u>	<u>Event</u>	<u>Maximum Flood Stage Elevation (NGVD)</u>	<u>Feet Below Crest of Emergency Spillway (El. 1149.9)</u>
9/26/75	Hurricane Eloise	1145.2	4.7
6/24/72	Hurricane Agnes	1142.5	7.4
2/24/75	--	1141.5	8.4

It should be noted that floodwaters have never reached the emergency spillway crest.

5.6 OVERTOPPING POTENTIAL

The results of the HEC-1 DB computer analysis indicate that the crest of the dam is not overtopped by the PMF event. The PMF discharge rate of 1990 CFS would occur at a peak flood stage of 1154.1 feet, which is 2.5 feet below the crest of the dam.

The results of the analysis are tabulated below:

<u>Flood Condition</u>	<u>Peak Inflow (CFS)</u>	<u>Peak Outflow (CFS)</u>	<u>Maximum Stage Elevation (NGVD)</u>
0.5 PMF	1043	910	1152.5
1.0 PMF	2086	1990	1154.1

5.7 EVALUATION

Using the Corps of Engineers' screening criteria for initial review of spillway adequacy, it has been determined that the dam would not be overtopped by either the full Probable Maximum Flood (PMF) or one half the PMF. Approximately 2.5 feet of freeboard would exist between the PMF maximum water level and the crest of the dam. Therefore, the spillway is adjudged to be adequate.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

There was no visible evidence of settlement, lateral movement or other signs of structural instability of the dam during the site examination. However, the pool level was approximately 20 feet below the top of the dam at the time, with the result that the forces tending to cause instability were much lower than design levels. Based on the conditions that were observed, there is no reason to question the static structural stability of the dam.

b. Design and Construction Data

Soil Conservation Service record drawings for the Little Choconut Watershed Site 2A Dam (See Appendix F) show a configuration and cross section for the embankment that corresponds to the information presented and analyzed in the SCS Geology Report, dated February 1966; in the Memorandum presenting test results, design parameters and stability analyses, dated April 20, 1966; and in the Design Report, dated November 1966.

While there is no construction data available to confirm the actual physical properties of the earthfill in the embankment, the design properties presented in the SCS reports are considered to be reasonable, and the dam would be expected to have adequate safety margins with respect to stability under static loading conditions. Additionally, toe drains control the phreatic surface and provide a safe outlet for foundation seepage.

A slope stability analysis was performed by the SCS on the embankment of the dam using the Swedish Circle method and adopted design data (See page D-6 of Appendix D). The results of the analysis are tabulated below:

<u>Location</u>	<u>Slope (H:V)</u>	<u>Conditions</u>	<u>Factor of Safety</u>
Upstream slope	3:1	Full drawdown; no berm	2.8
Downstream slope	2.5:1	No drain; no berm	2.5

The assumptions and method used are considered reasonable; therefore, the resulting factors of safety are adequate.

c. Seismic Stability

The Little Choconut Watershed Site 2A Dam is located in Seismic Zone 1, and in accordance with recommended Phase I guidelines does not require seismic analysis.

SECTION 7 - ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Condition

On the basis of the visual examination, the Little Chocanut Watershed Site 2A Dam is considered to be in good condition. There were no signs of impending structural failure or other conditions which would warrant urgent remedial action, and only minor deficiencies were noted.

b. Adequacy of Information

The evaluation of this dam is based primarily on visual examination, reference to available SCS plans, approximate hydraulic and hydrologic computations, and application of engineering judgement. The visual examination was somewhat hampered by low pool level and light snow cover; however, the available information that was obtained is adequate for the purposes of a Phase I assessment.

c. Need for Additional Investigations

No additional investigations are required for this dam.

d. Urgency

The recommended measures presented in Section 7.2 should be carried out by the owner within 12 months of the final approval date of this report. In the interim, a detailed flood warning and emergency evacuation plan should be developed and implemented.

7.2 RECOMMENDED MEASURES

Although the dam is generally in good condition, it is considered important that the following items be accomplished:

- a. Repair local erosion gullies along the upper portion of the left side of the spillway outlet channel.
- b. Mow the vegetation on the slopes of the dam embankment and emergency spillway annually.
- c. Control access and foot traffic and take necessary measures to prevent erosion.
- d. Remove cattails in front of the drop inlet structure, and along the toe of the upstream slope of the dam.

- e. Remove the barbed wire fence across the entrance to the approach channel of the emergency spillway.

APPENDIX A
PHOTOGRAPHS

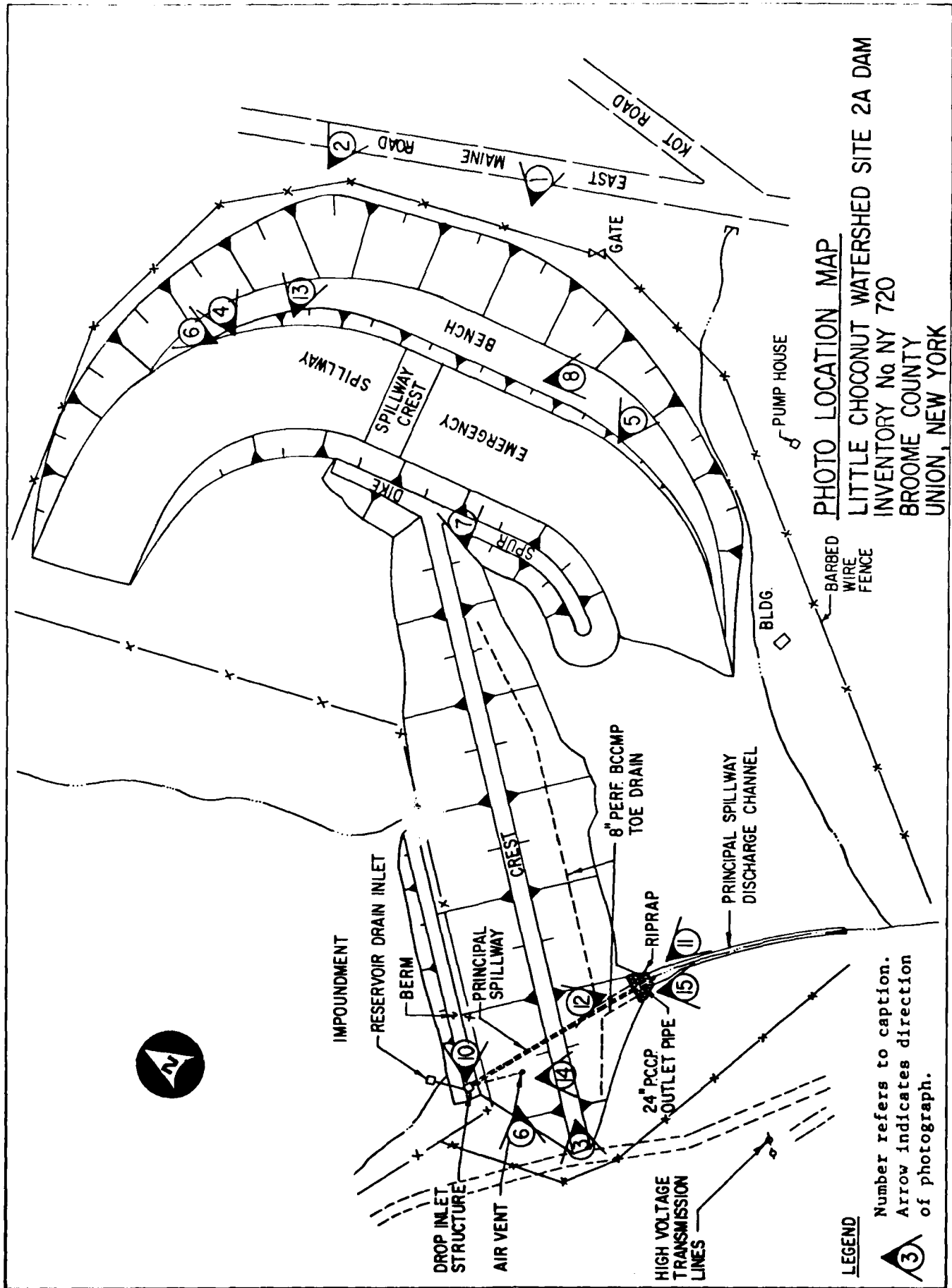


PHOTO LOCATION MAP
 LITTLE CHOCONUT WATERSHED SITE 2A DAM
 INVENTORY No NY 720
 BROOME COUNTY
 UNION, NEW YORK

LEGEND
 Number refers to caption.
 Arrow indicates direction
 of photograph.



PHOTO #2: Overview of watershed and impoundment



PHOTO # 3: Crest of dam looking toward left abutment



PHOTO #4: Overview of upstream face of dam



PHOTO #5: Overview of downstream face of dam



PHOTO #6: Upstream face of dam and air vent

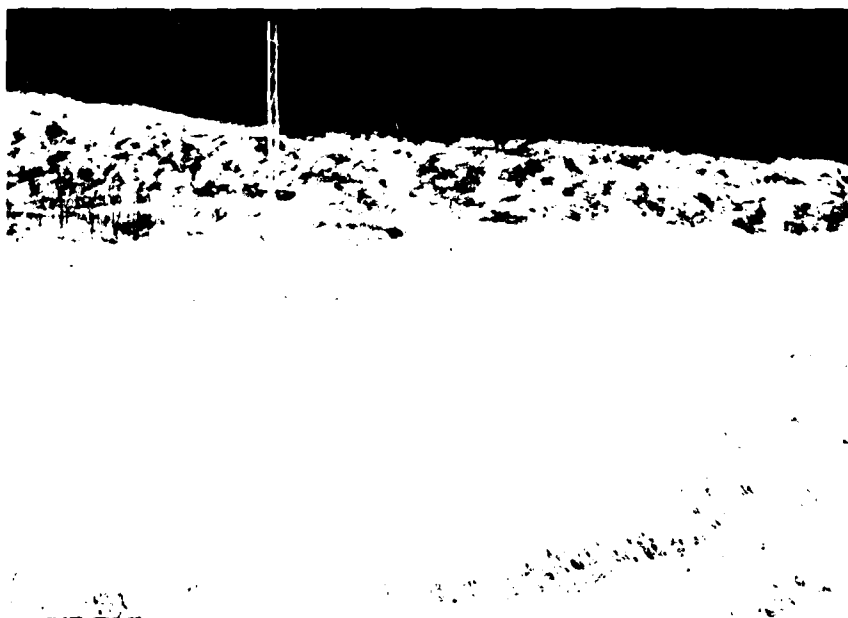


PHOTO #7: Downstream face of dam



PHOTO #8: Emergency spillway looking upstream



PHOTO #9: Crest of emergency spillway looking downstream



PHOTO #10: Drop inlet structure



PHOTO #11: Outlet works: 24" prestressed concrete cylinder pipe (P.C.C.P.) and toe drains

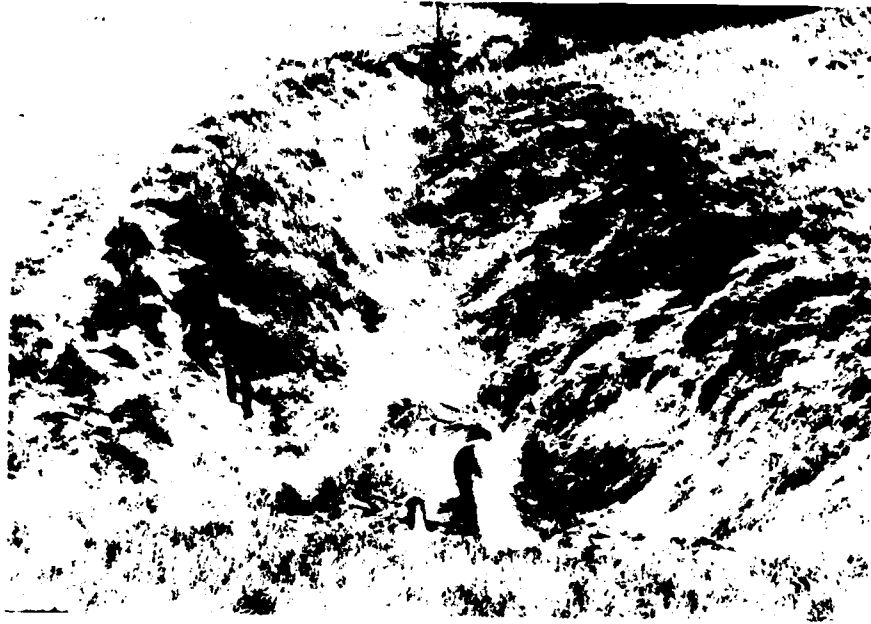


PHOTO #12: Downstream channel conditions



PHOTO #13: Impoundment



PHOTO #14: Air vent and drop
inlet structure



PHOTO # 15: Toe drain (flowing)

APPENDIX B
VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Little Choconut Watershed-Site 2A Dam

Fed. I.D. # NY 720

DEC Dam No. 96A-3628

River Basin Susquehanna

Location: Town Union

County Broome

Stream Name Unnamed

Tributary of Little Choconut Creek

Latitude (N) 42°-08.8'

Longitude (W) 75°-57.4'

Type of Dam Earthen embankment

Hazard Category High

Date(s) of Inspection December 15, 1980

Weather Conditions Overcast - 15^o F.

Reservoir Level at Time of Inspection Elevation 1136.8

b. Inspection Personnel R.C. Smith, T.L. Ward and J.G. MacBroom of Flaherty Giavara Associates; P.L. LeCount and J.J. Rixner of Haley & Aldrich, Inc.; S. Dhawan and L. Comrie of Salmon Associates

c. Persons Contacted (Including Address & Phone No.)

Garv L. Page

Donald W. Lake, Jr.

Binghamton Watershed Office

Soil Conservation Service

Soil Conservation Service

771 Federal Building

P.O. Box 1255

100 South Clinton Street

Broome County Airport

Syracuse, NY 13260

Binghamton, NY 13902

(315) 423-5505

(607) 773-2751

d. History:

Date Constructed 1968

Date(s) Reconstructed Never

Designer Soil Conservation Service

Constructed By Les Strong, Inc.

Owner County of Broome

2) Embankment

a. Characteristics

- (1) Embankment Material Silty and clayey gravel
- (2) Cutoff Type Compacted glacial till
- (3) Impervious Core None
- (4) Internal Drainage System Two perforated 8" BCCMP toe drains on either side of principal spillway outlet; right pipe-dry, left pipe flowing (1± GPM)
- (5) Miscellaneous No comments

b. Crest

- (1) Vertical Alignment Excellent; slightly crowned at the center of the dam.
- (2) Horizontal Alignment Excellent; substantially straight
- (3) Surface Cracks None observed
- (4) Miscellaneous Mowed grass

c. Upstream Slope

- (1) Slope (Estimate - V:H) 1:3
- (2) Undesirable Growth or Debris, Animal Burrows Cattails growing at the toe of slope and around the drop inlet structure
- (3) Sloughing, Subsidence or Depressions None evident

(4) Slope Protection Grass, 18+" high

(5) Surface Cracks or Movement at Toe None evident; footpath along berm
at toe of slope

d. Downstream Slope

(1) Slope (Estimate - V:H) 1:2.5

(2) Undesirable Growth or Debris, Animal Burrows None evident

(3) Sloughing, Subsidence or Depressions None evident

(4) Surface Cracks or Movement at Toe None evident

(5) Seepage None observed

(6) External Drainage System (Ditches, Trenches, Blanket) None observed

(7) Condition Around Outlet Structure Riprap surrounds the outlets
of the principal spillway and toe drains

(8) Seepage Beyond Toe None observed

e. Abutments - Embankment Contact

Good condition

(1) Erosion at Contact None evident

(2) Seepage Along Contact None observed

3) Drainage System

a. Description of System Drop inlet structure consisting of a reinforced concrete riser, a 24 inch diameter conduit and a bedrock discharge channel

b. Condition of System Excellent

c. Discharge from Drainage System Channel excavated out of bedrock

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Peizometers, Etc.)

Monumentation of centerline of dam

5) Reservoir

- a. Slopes Gentle slopes with scattered trees on all sides except the right side which has a heavily wooded steep slope
- b. Sedimentation Design figures for storage allow for 19 acre-feet of sediment
- c. Unusual Conditions Which Affect Dam Low sediment pool level

6) Area Downstream of Dam

- a. Downstream Hazard (No. of Homes, Highways, etc.) Approximately 8 dwellings are within the flood hazard area as well as East Maine Road, Airport Road and Stella Ireland Road
- b. Seepage, Unusual Growth None observed
- c. Evidence of Movement Beyond Toe of Dam None observed
- d. Condition of Downstream Channel Some degradation of streambed in recent years, but currently stable; exposed, weathered bedrock along right side

7) Spillway(s) (Including Discharge Conveyance Channel)

Principal spillway, emergency spillway and discharge conveyance channel

- a. General Principal spillway and discharge conveyance channel handle normal flows, while the emergency spillway conveys flood events with average return frequencies greater than 100 years.
- b. Condition of Principal Spillway Very good; however, cattails are growing around the orifice and would impede flood flows during submergence of the drop inlet structure.

c. Condition of Emergency Spillway Very good; however, a barbed wire fence across the entrance to the approach channel would collect debris causing a flow rate reduction. The discharge channel leads to a broad spoil area which appears to slope toward the toe of dam, thereby allowing water to flow along the toe.

d. Condition of Discharge Conveyance Channel Fair; there are numerous sloughs, evidence of surface erosion and the banks have a heavy grass cover and isolated shrubs.

8) Reservoir Drain/Outlet

Type: Pipe Two Conduit _____ Other _____

Material: Concrete X Metal X Other _____

Size: Concrete: 24 inch, Metal: 6 inch Length 163 feet and 22 feet

Invert Elevations: Entrance 1131.0 Exit 1127.5

Physical Condition (Describe): Unobservable X

Material: Prestressed concrete cylinder and cast iron

Joints: Rubber/steel and mechanical Alignment straight

Structural Integrity: Excellent

Hydraulic Capability: Good

Means of Control: Flat frame
Gate slide gate Valve _____ Uncontrolled _____

Operation: Operable X Inoperable _____ Uncontrolled _____

Present Condition (Describe): Each pipe is in excellent condition

9) Structural

a. Concrete Surfaces Excellent condition

b. Structural Cracking None observed

c. Movement - Horizontal & Vertical Alignment (Settlement) None evident

d. Junctions with Abutments or Embankments Not applicable

e. Drains - Foundation, Joint, Face See Section 2) Embankment, a. Characteristics,
(4) Internal Drainage System

f. Water Passages, Conduits, Sluices 6 inch flat frame slide gate on the reservoir
drain at its inlet to the reinforced concrete riser

g. Seepage or Leakage None observed

h. Joints - Construction, etc. Rubber and steel joints on the 24" prestressed concrete cylinder pipe and mechanical joints on the 6" reservoir drain

i. Foundation Not applicable

j. Abutments Not applicable

k. Control Gates 6" flat frame gate on the reservoir drain at its inlet to the reinforced concrete riser

l. Approach & Outlet Channels Not applicable

m. Energy Dissipators (Plunge Pool, etc.) Bedrock channel downstream of principal spillway outlet

n. Intake Structures Reinforced concrete riser has a 14" X 12" orifice

o. Stability No evidence of structural instability

p. Miscellaneous No comments

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

a. Description and Condition None

APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	<u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>1156.6</u>	<u>24.3</u>	<u>302</u>
2) Design High Water (Max. Design Pool)	<u>1151.7</u>	<u>20.6</u>	<u>192</u>
3) Emergency Spillway Crest	<u>1149.9</u>	<u>19.2</u>	<u>155</u>
4) Pool Level with Flashboards	<u>--</u>	<u>--</u>	<u>--</u>
5) Principal Spillway Crest	<u>1136.8</u>	<u>4.0</u>	<u>8</u>

DISCHARGES:

	<u>Volume</u> (cfs)
1) Average Daily	<u>Unknown</u>
2) Emergency Spillway @ Maximum High Water (Top of Dam)	<u>3635</u>
3) Emergency Spillway @ Design High Water	<u>366</u>
4) Principal Spillway @ Emergency Spillway Crest	<u>20</u>
5) Low Level Outlet @ Principal Spillway Crest	<u>2</u>
6) Total (of all facilities) @ Maximum High Water	<u>3660</u>
7) Maximum Known Flood	<u>Unknown</u>
8) At Time of Inspection	<u>1±</u>

CREST:

ELEVATION: 1156.6

Type Earthen Embankment

Width 14± Ft Length 530 Ft

Spillover Vegetated emergency spillway

Location Left abutment

SPILLWAY:

PRINCIPAL

EMERGENCY

1136.8

Elevation

1149.9

Drop Inlet Structure

Type

Earth Excavated

14" x 12" orifice with
vertical face

Width

80 feet

Type of Control

Orifice

Uncontrolled

Weir

-

Controlled

-

-

Type:
(Flashboards; gate)

-

One

Number

One

24 in/163 ft

Size/Length

80 ft/650 ft

Concrete

Invert Material

Grass surface on earth

Continuously

Anticipated Length
of Operating Service

9.34 hours

Not Applicable

Chute Length

310 feet

1 ft

Height Between
Spillway Crest
& Approach Channel
Invert (Weir Flow)

Slope = 0.010

Type: _____

Location: _____

Records:

Date September 26, 1975

Max. Reading Elevation 1145.2 (NGVD)

FLOOD WATER CONTROL SYSTEM:

Warning System Under preparation by the Broome County Soil & Water Conservation
District

Method of Controlled Releases (mechanisms) Manually controlled slide gate to
drain the impoundment

DRAINAGE AREA: 406 Acres, 0.63 Square Miles

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type Rural Agriculture

Terrain - Relief Rolling

Surface - Soil Glacial Till

Runoff Potential (existing or planned extensive alterations to existing
(surface or subsurface conditions)

Dense glacial till soils with open fields some residential houses.

Average watershed slope is 10+%

Potential Sedimentation problem areas (natural or man-made; present or future)

Surface erosion from fields during fallow periods

Potential Backwater problem areas for levels at maximum storage capacity
including surcharge storage:

None

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the reservoir
perimeter:

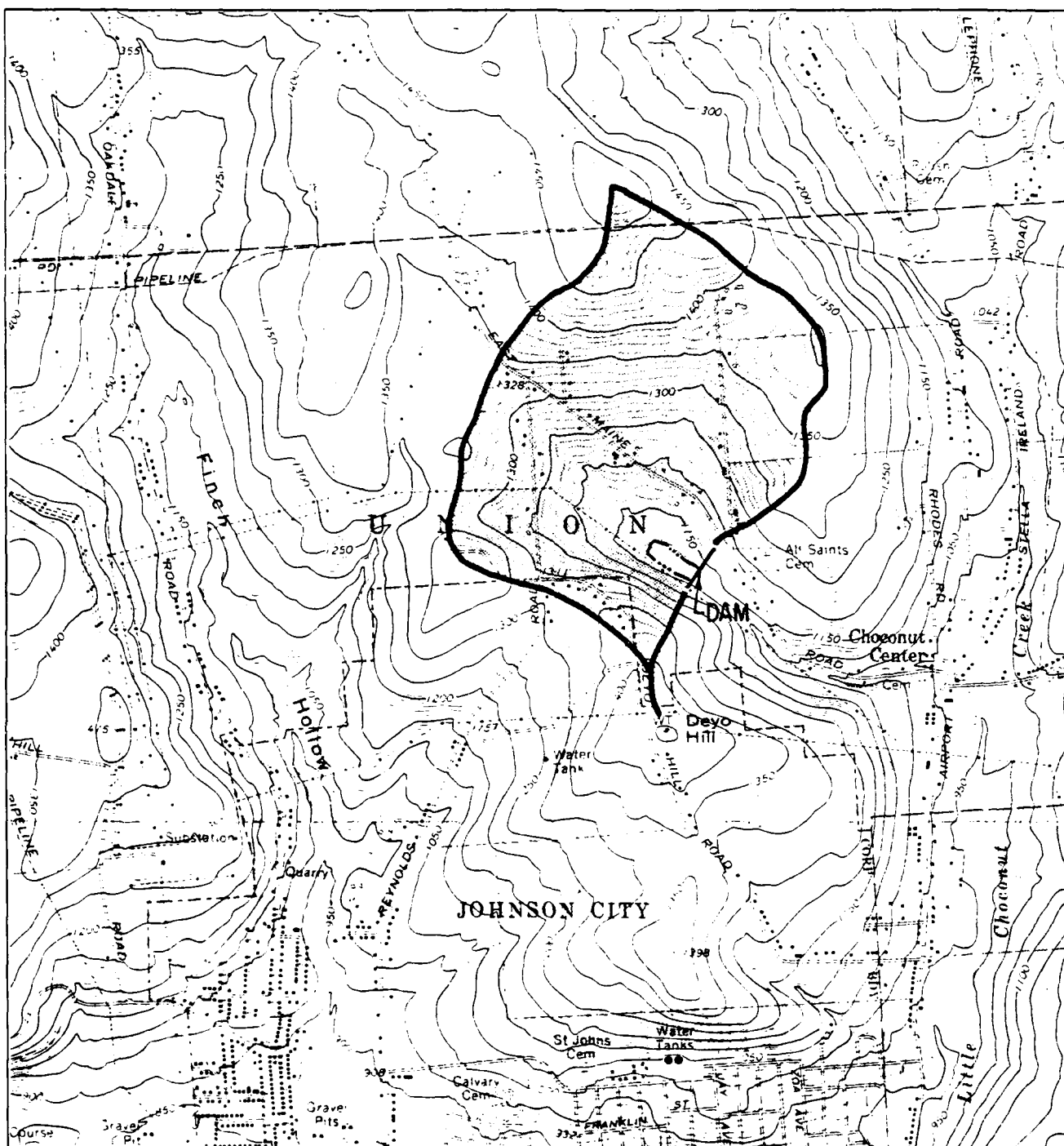
Location: Spur dike at the left end of the dam embankment

Elevation: 1148.2 to 1156.6 (NGVD)

Reservoir:

Length @ Maximum Pool 1300 ft = 1/2 mile (Miles)

Length of Shoreline (@ Spillway Crest) 4250+ ft = 0.8 miles (Miles)



WATERSHED MAP

LITTLE CHOCONUT WATERSHED SITE 2A DAM
INVENTORY No. NY 720

SUSQUEHANNA RIVER BASIN
BROOME COUNTY
UNION, NEW YORK



0 2000 4000
SCALE IN FEET

FLAHERTY • GIAVARA ASSOCIATES, P.C.

CALCULATIONS



WATERSHED DATA
FOR HEC-1 SNYDER HYDROGRAPH

1) TIME TO PEAK (T_P)

$$T_P = C_T \left(\frac{L \times L_c}{\sqrt{S}} \right)^N \quad \text{From: Linsley, Kohler, Paulus}$$

$$L = 6300 \text{ FT} = 1.19 \text{ miles}$$

$$L_c = 2300 \text{ FT} = 0.44 \text{ miles (From USGS map)}$$

$$\Delta h = 1540' - 1140' = 400'$$

$$S = \frac{400'}{6300'} = 0.0635 \text{ FT/FT}$$

$$C_T = 1.2 \text{ For Steep Slopes}$$

$$T_P = 1.2 \left(\frac{1.19 \times 0.44}{\sqrt{0.0635}} \right)^{0.38} = 1.58 \text{ HOURS}$$

2) Set $C_p = 0.625$ FOR HIGHLAND AREA

3) % IMPERVIOUS

$$\begin{aligned} \text{ROADS} &- 12000 \text{ LF} \times 25' = 300,000 \text{ FT}^2 \\ \text{houses} &- 50 \pm @ 1000 \text{ FT}^2 = 50,000 \text{ FT}^2 \\ &\underline{350,000 \text{ FT}^2} \\ &= 8 \text{ ACRES} \end{aligned}$$

$$\frac{8 \text{ ACRES}}{406 \text{ ACRES}} = 2 \% \text{ OF WATERSHED}$$

4) WATERSHED AREA

$$\begin{aligned} 406 \text{ ACRES} / 640 &= 0.634 \text{ SQ MILES} \\ \text{BASED ON } 1'' &= 2000' \text{ USGS MAP,} \end{aligned}$$

PROJECT COPOS DAMS
NY # 720



FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA NEW HAVEN CONN 06510/203-789-1200

SHEET NO. 2 OF 5
BY JGM DATE 1/28/81
CHK'D BY PFC DATE 2/2/81

5) RAINFALL DATA (FROM HR #33 AS REPRINTED
IN "DESIGN OF SMALL DAMS")

6 HOUR DURATION PMP = 23.5 INCHES
FOR 10 SQUARE MILES

<u>DURATION HRS</u>	<u>ADJ. FACTOR, %</u>
6	100
12	110
24	120
48	127



PRINCIPAL SPILLWAY STAGE-DISCHARGE CURVE

PRINCIPAL SPILLWAY ACTS AS AN ORIFICE

CL ELEV. IS 1137.3
 AREA = 1.2 FT²
 C = 0.6

$$Q = CA \sqrt{2GH} = CA \sqrt{2G} (H^{1/2})$$

$$Q = (0.6)(1.2 \text{ FT}^2) (\sqrt{64.4}) H^{1/2} = 5.73 H^{1/2}$$

<u>STAGE</u> <u>(FT)</u>	<u>HEAD, FT</u> <u>(STAGE - 1137.3)</u>	<u>DISCHARGE, CFS</u> <u>(5.73 H^{1/2})</u>
1140.0	2.7	9.5
1144.0	6.7	15.0
1149.9	12.6	20.5
1151.7	14.4	21.9
1156.6	19.3	25.4
1160.0	22.7	27.5
1165.0	27.7	30.4

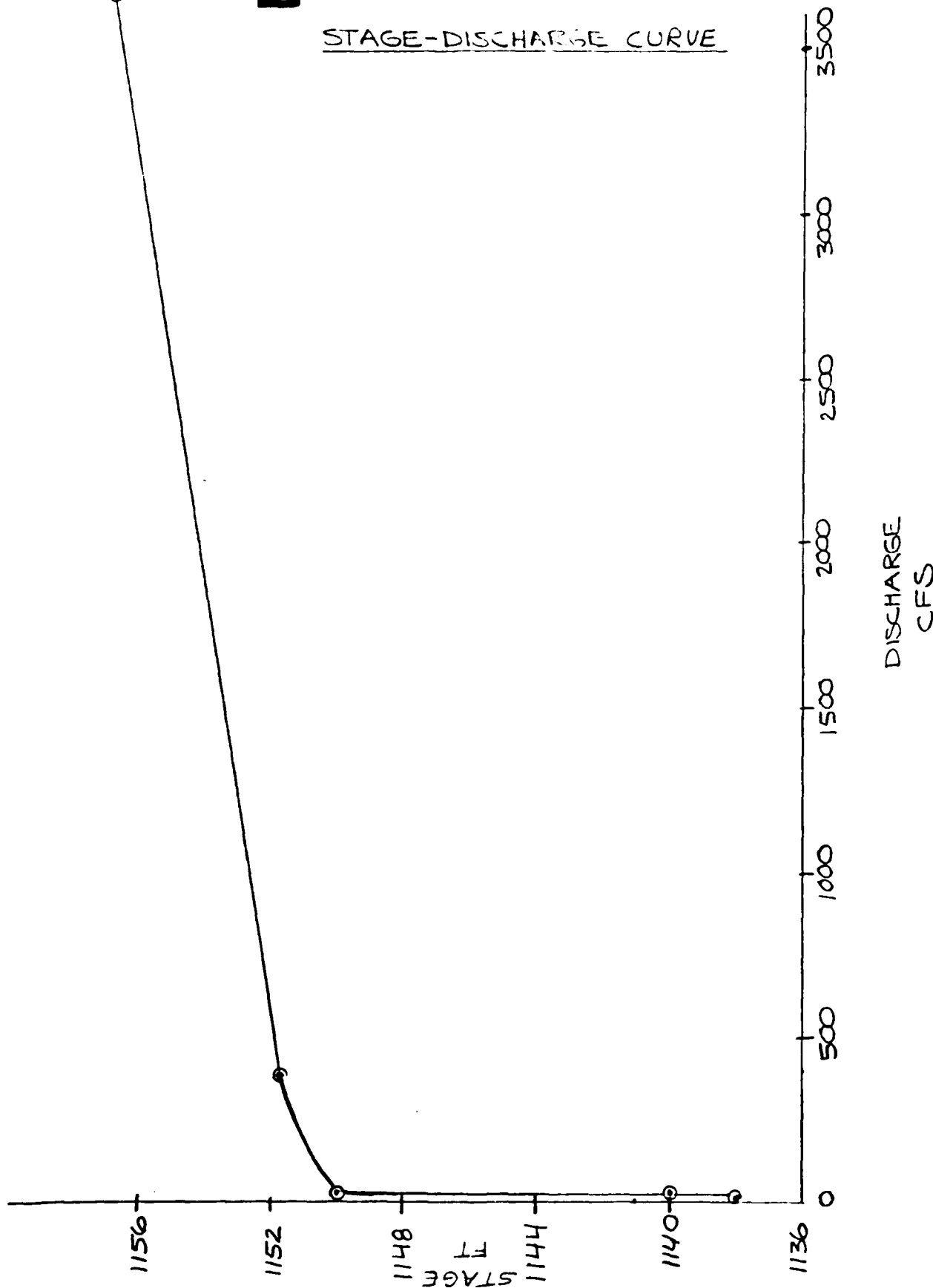
ECT Corps Data
NY = 720



FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA NEW HAVEN CONN 06510-203 789 1280

SHEET NO. 4 OF 5
BY: JGM DATE: 1/21/81
CHK'D BY: JEC DATE: 2/2/81

STAGE-DISCHARGE CURVE





EMERGENCY SPILLWAY DISCHARGE CHANNEL

$$b = 80 \text{ FT}$$

$$Z = 3 : 1$$

$$S = 3 \%$$

$$N = 0.040$$

$$Q = 1990 \text{ CFS (PMF DISCHARGE)}$$

FIND D, A, V

$$Q = \frac{K'}{N} b^{8/3} S^{1/2} \quad (\text{KINGS HANDBOOK TABLE 7-11})$$

$$K' = \frac{1990(0.04)}{(80^{2.67} (0.03)^{0.5})} = 0.00381$$

$$\text{INTERPOLATE} = \frac{00381 - 00223}{443 - 223} = 0.72$$

$$\frac{D}{b} = 0.02 + 0.0072 = 0.0272$$

$$D = 80(0.0272) = 2.18 \text{ FT}$$

$$A = 80'(2.18') + \frac{1}{2}(2.18 \times 3 \times 2.18) \times 2$$

$$= 174.4 + 14.3 = 188.7 \text{ FT}^2$$

$$\text{AVE. Vel} = \frac{Q}{A} = \frac{1990 \text{ CFS}}{188.7 \text{ FT}^2} = 10.5 \text{ FPS}$$

THIS VELOCITY IS MARGINAL FOR USE ON
 VEGETATED LININGS, SOME EROSION MAY
 OCCUR, REFER TO SCS TR-60.

HEC-1 FLOOD HYDROGRAPH COMPUTATIONS

```

*****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
LAST MODIFICATION 26 FEB 79
*****
1  A1 NATIONAL DAM INSPECTION PROGRAM      PHASE 1 REPORT      CORPS OF ENGINEERS
2  A2 DAM I.D. #NY720                      SITE 2A BROOME COUNTY NEW YORK 1/24/81
3  A3 PREPARED BY FLAHERTY DIAVARA ASSOC. , NEW HAVEN , CONNECTICUT
4  B 120 0 30 0 0 0 0 2 0 0
5  B1 5
6  J 1 9 1
7  J1 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 1.0
8  K 0
9  K1 INFLOW HYDROGRAPH , SNYDER METHOD
10 M 1 1 0.63
11 P 0 23.5 100 110 120 127
12 T
13 W 1.58 0.625
14 X -2. 2. 1.
15 K 1
16 K1 RESERVOIR ROUTING      MODIFIED FULS METHOD
17 Y 1 1
18 V1 3
19 V41136.8 1140.0 1149.9 1151.7 1156.6
20 Y5 0 9.5 19.9 388 360
21 #A 4.0 9.2 13.8 19.2 20.6 24.3 26.0
22 #E1134.8 1140.0 1144.0 1149.9 1151.7 1156.6 1160.0
23 #1149.9
24 #1156.6 2.5 1.5 550.
25 K 99

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT      1
ROUTE HYDROGRAPH TO      1
END OF NETWORK

```

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*****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
LAST MODIFICATION 26 FEB 79
*****

```

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RUN DATE# 81/02/09.
TIME# 14.55.37.

```

NATIONAL DAM INSPECTION PROGRAM PHASE 1 REPORT CORPS OF ENGINEERS

NO NHR NHIN IDAY IHR IMIN MEIRC IFLT IPRT NSTAN
 120 0 30 0 0 0 0 2 0 0
 JOFER NWI LROPT TRACE
 5 0 0 0 0

MULTI-PLAN ANALYSES TO BE PERFORMED
 MPLAN= 1 MPTIO= 9 LRTIO= 1

RTIOS= .10 .20 .30 .40 .50 .60 .70 .80 1.00

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH , SNYDER METHOD

ISTAQ IECON ITAPE JFLT JFRT INAME ISTATE IAU10
 1 0 0 0 0 0 1 0 0

INYDQ IUNG TAREA SNAP TRSDA TRSFC RATIO ISNOW ISAME LOCAL
 1 1 .63 0.00 .63 1.00 0.000 0 1 0

PRECIP DATA

SFPE FM9 R6 R12 R24 R48 R72 R96
 0.00 23.50 100.00 110.00 120.00 127.00 0.00 0.00

LOSS DATA
 LROPT STRKR DLTKR RTIOL ERRAIN STRKS RTIOK STRTL CNSTL ALSMX RTIMF
 0 0.00 0.00 1.00 0.00 0.00 1.00 1.00 1.00 0.00 0.00 .02

UNIT HYDROGRAPH DATA

TP= 1.58 CF= .63 NTA= 0

RECESSION DATA

STRIO= -2.00 GRCSN= 2.00 RTIOR= 1.00
 APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 3.85 AND R= 2.79 INTERVALS

UNIT HYDROGRAPH 17 END-OF-PERIOD ORDINATES, LAG= 1.58 HOURS, CF= .62 VOL= 1.00
 23. 82. 139. 155. 126. 88. 61. 42. 29. 21.
 14. 10. 7. 5. 3. 2. 2.

HO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	CONF Q	HO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	CONF Q
1.01	.30	1	.00	.00	.00	1.	1.02	6.30	61	.20	.15	.05	27.
1.01	1.00	2	.00	.00	.00	1.	1.02	7.00	62	.20	.15	.05	37.
1.01	1.30	3	.00	.00	.00	1.	1.02	7.30	63	.20	.15	.05	54.
1.01	2.00	4	.00	.00	.00	1.	1.02	8.00	64	.20	.15	.05	72.
1.01	2.30	5	.00	.00	.00	1.	1.02	8.30	65	.20	.15	.05	87.
1.01	3.00	6	.00	.00	.00	1.	1.02	9.00	66	.20	.15	.05	97.
1.01	3.30	7	.00	.00	.00	1.	1.02	9.30	67	.20	.15	.05	104.
1.01	4.00	8	.00	.00	.00	1.	1.02	10.00	68	.20	.15	.05	109.
1.01	4.30	9	.00	.00	.00	1.	1.02	10.30	69	.20	.15	.05	113.
1.01	5.00	10	.00	.00	.00	1.	1.02	11.00	70	.20	.15	.05	115.
1.01	5.30	11	.00	.00	.00	1.	1.02	11.30	71	.20	.15	.05	117.
1.01	6.00	12	.00	.00	.00	1.	1.02	12.00	72	.20	.15	.05	118.
1.01	6.30	13	.01	.00	.01	1.	1.02	12.30	73	1.18	1.13	.05	141.
1.01	7.00	14	.01	.00	.01	1.	1.02	13.00	74	1.18	1.13	.05	272.
1.01	7.30	15	.01	.00	.01	1.	1.02	13.30	75	1.41	1.36	.05	364.

1.01	8.30	16	.01	.00	.01	.00	.01	1.	1.02	14.00	.76	1.41	1.36	.05	535.
1.01	9.00	17	.01	.00	.01	.00	.01	1.	1.02	14.30	77	1.76	1.71	.05	699.
1.01	9.30	18	.01	.00	.01	.00	.01	1.	1.02	15.00	78	1.76	1.71	.05	850.
1.01	10.00	19	.01	.00	.01	.00	.01	1.	1.02	15.30	79	2.14	2.09	.05	998.
1.01	10.30	20	.01	.00	.01	.00	.01	1.	1.02	16.00	80	6.79	6.74	.05	1253.
1.01	11.00	21	.01	.00	.01	.00	.01	1.	1.02	16.30	81	1.65	1.60	.05	1653.
1.01	11.30	22	.01	.00	.01	.00	.01	1.	1.02	17.00	82	1.65	1.60	.05	2000.
1.01	12.00	23	.01	.00	.01	.00	.01	1.	1.02	17.30	83	1.29	1.24	.05	2086.
1.01	12.30	24	.01	.00	.01	.00	.01	1.	1.02	18.00	84	1.29	1.24	.05	1908.
1.01	13.00	25	.07	.00	.07	.00	.07	1.	1.02	18.30	85	.12	.07	.05	1635.
1.01	13.30	26	.07	.00	.07	.00	.07	2.	1.02	19.00	86	.12	.07	.05	1347.
1.01	14.00	27	.08	.00	.08	.00	.08	2.	1.02	19.30	87	.12	.07	.05	1044.
1.01	14.30	28	.08	.00	.08	.00	.08	2.	1.02	20.00	88	.12	.07	.05	765.
1.01	15.00	29	.10	.00	.10	.00	.10	2.	1.02	20.30	89	.12	.07	.05	549.
1.01	15.30	30	.10	.00	.10	.00	.10	2.	1.02	21.00	90	.12	.07	.05	398.
1.01	16.00	31	.13	.00	.12	.00	.12	2.	1.02	21.30	91	.12	.07	.05	293.
1.01	16.30	32	.40	.20	.20	.05	.05	7.	1.02	22.00	92	.12	.07	.05	220.
1.01	17.00	33	.10	.05	.05	.05	.05	20.	1.02	22.30	93	.12	.07	.05	169.
1.01	17.30	34	.10	.05	.05	.05	.05	35.	1.02	23.00	94	.12	.07	.05	133.
1.01	18.00	35	.08	.03	.05	.03	.05	43.	1.02	23.30	95	.12	.07	.05	108.
1.01	18.30	36	.08	.03	.05	.03	.05	43.	1.03	0.00	96	.12	.07	.05	90.
1.01	19.00	37	.01	.00	.01	.00	.01	38.	1.03	.30	97	0.00	0.00	0.00	71.
1.01	19.30	38	.01	.00	.01	.00	.01	31.	1.03	1.00	98	0.00	0.00	0.00	59.
1.01	20.00	39	.01	.00	.01	.00	.01	24.	1.03	1.30	99	0.00	0.00	0.00	45.
1.01	20.30	40	.01	.00	.01	.00	.01	18.	1.03	2.00	100	0.00	0.00	0.00	31.
1.01	21.00	41	.01	.00	.01	.00	.01	13.	1.03	2.30	101	0.00	0.00	0.00	21.
1.01	21.30	42	.01	.00	.01	.00	.01	9.	1.03	3.00	102	0.00	0.00	0.00	15.
1.01	22.00	43	.01	.00	.01	.00	.01	7.	1.03	3.30	103	0.00	0.00	0.00	11.
1.01	22.30	44	.01	.00	.01	.00	.01	5.	1.03	4.00	104	0.00	0.00	0.00	8.
1.01	23.00	45	.01	.00	.01	.00	.01	4.	1.03	4.30	105	0.00	0.00	0.00	6.
1.01	23.30	46	.01	.00	.01	.00	.01	3.	1.03	5.00	106	0.00	0.00	0.00	4.
1.01	24.00	47	.01	.00	.01	.00	.01	3.	1.03	5.30	107	0.00	0.00	0.00	3.
1.02	0.00	48	.01	.00	.01	.00	.01	2.	1.03	6.00	108	0.00	0.00	0.00	3.
1.02	.30	49	.08	.03	.05	.03	.05	2.	1.03	6.30	109	0.00	0.00	0.00	2.
1.02	1.00	50	.08	.03	.05	.03	.05	5.	1.03	7.00	110	0.00	0.00	0.00	2.
1.02	1.30	51	.08	.03	.05	.03	.05	9.	1.03	7.30	111	0.00	0.00	0.00	2.
1.02	2.00	52	.08	.03	.05	.03	.05	13.	1.03	8.00	112	0.00	0.00	0.00	2.
1.02	2.30	53	.08	.03	.05	.03	.05	17.	1.03	8.30	113	0.00	0.00	0.00	2.
1.02	3.00	54	.08	.03	.05	.03	.05	19.	1.03	9.00	114	0.00	0.00	0.00	2.
1.02	3.30	55	.08	.03	.05	.03	.05	21.	1.03	9.30	115	0.00	0.00	0.00	2.
1.02	4.00	56	.08	.03	.05	.03	.05	22.	1.03	10.00	116	0.00	0.00	0.00	2.
1.02	4.30	57	.08	.03	.05	.03	.05	23.	1.03	10.30	117	0.00	0.00	0.00	2.
1.02	5.00	58	.08	.03	.05	.03	.05	24.	1.03	11.00	118	0.00	0.00	0.00	2.
1.02	5.30	59	.08	.03	.05	.03	.05	24.	1.03	11.30	119	0.00	0.00	0.00	2.
1.02	6.00	60	.08	.03	.05	.03	.05	24.	1.03	12.00	120	0.00	0.00	0.00	2.
SUM	29.84	26.21	3.64	21356.	(758.)	(666.)	(92.)	(604.73)							

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CF8	2086.	1347.	435.	178.		21360.
CMS	59.	38.	12.	5.		605.
INCHES		19.89	25.70	26.28		26.28
MM		505.19	652.90	667.59		667.59
AC-FT		668.	863.	883.		883.
THOUS CU H		824.	1065.	1089.		1089.

* JND *

	INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(F)						FREQ(I,I) AND EXCESS(X
	800.	1200.	1600.	2000.	2400.		
0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	6.	2.

1.00 21
1.30 31
2.00 41
2.30 51
3.00 61
3.30 71
4.00 81
4.30 91
5.00 101
5.30 111
6.00 121
6.30 131
7.00 141
7.30 151
8.00 161
8.30 171
9.00 181
9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 331
17.00 341
17.30 351
18.00 361
18.30 371
19.00 381
19.30 391
20.00 401
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 621
7.30 631
8.00 641
8.30 651
9.00 661

3.	4.	5.	6.	7.	8.	9.	10.	11.
12.	14.	22.	36.	54.	70.	85.	100.	11.
165.	200.	209.	191.	143.	135.	104.	76.	125.
29.	17.	13.	11.	9.	7.	6.	55.	40.
2.	1.	1.	1.	0.	0.	0.	0.	3.
0.	0.	0.	0.	0.	0.	0.	0.	0.

FEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
209.	135.	44.	18.	2136.
6.	4.	1.	1.	60.
	1.99	2.57	2.63	2.63
	50.52	65.29	66.76	66.76
	47.	86.	88.	88.
	82.	106.	109.	109.

HYDROGRAPH AT STA		1 FOR PLAN 1, RTIO 2	
0.	0.	0.	0.
0.	0.	0.	0.
0.	0.	0.	0.
0.	0.	0.	0.
0.	7.	9.	8.
1.	1.	1.	1.
2.	1.	1.	1.
3.	4.	4.	5.
7.	14.	19.	21.
23.	28.	73.	107.
331.	417.	327.	269.
59.	34.	22.	18.
4.	2.	1.	1.
0.	0.	0.	0.

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
417.	269.	87.	36.	4272.
12.	8.	2.	1.	121.
	3.98	5.14	5.26	5.26
	101.04	130.58	133.52	133.52
	134.	173.	177.	177.
	165.	213.	218.	218.

HYDROGRAPH AT STA		1 FOR PLAN 1, RTIO 3	
0.	0.	0.	0.
0.	0.	0.	0.
0.	0.	0.	0.
0.	0.	0.	1.
1.	10.	13.	11.
4.	2.	1.	1.
3.	6.	6.	7.
4.	16.	26.	31.
8.	42.	109.	210.
35.	67.	161.	255.
496.	626.	490.	313.
88.	51.	32.	21.
4.	3.	2.	1.
1.	1.	1.	1.

FEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
626.	404.	131.	53.	6408.
18.	11.	4.	2.	181.
	5.97	7.71	7.88	7.88
	151.56	195.87	200.28	200.28
	200.	259.	265.	265.
	247.	319.	327.	327.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 4

C-19

STAGE									
1138.0	1138.0	1137.9	1137.9	1137.9	1137.9	1137.9	1137.9	1137.8	1137.8
1137.8	1137.7	1137.7	1137.7	1137.7	1137.7	1137.7	1137.7	1137.6	1137.6
1137.6	1137.6	1137.5	1137.5	1137.5	1137.5	1137.5	1137.5	1137.5	1137.5
1137.4	1137.4	1137.4	1137.4	1137.4	1137.4	1137.4	1137.4	1137.5	1137.5
1137.5	1137.5	1137.5	1137.5	1137.4	1137.4	1137.4	1137.4	1137.4	1137.4
1137.4	1137.4	1137.4	1137.4	1137.4	1137.4	1137.4	1137.4	1137.4	1137.4
1137.4	1137.4	1137.5	1137.5	1137.6	1137.6	1137.6	1137.7	1137.8	1137.8
1137.9	1138.0	1138.1	1138.1	1138.0	1138.0	1138.0	1139.3	1139.7	1140.2
1140.8	1141.4	1142.2	1142.8	1143.3	1143.8	1144.1	1144.3	1144.5	1144.6
1144.7	1144.7	1144.7	1144.7	1144.7	1144.6	1144.6	1144.6	1144.6	1144.6
1144.5	1144.5	1144.4	1144.4	1144.4	1144.3	1144.3	1144.2	1144.2	1144.2
1144.1	1144.0	1144.0	1144.0	1143.9	1143.9	1143.9	1143.8	1143.8	1143.8

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CFS	14.	14.	12.	6.		757.
CMS	0.	0.	0.	0.		21.
INCHES		.21	.73	.93		.93
MM		5.38	18.54	23.66		23.66
AC-FT	7.	25.	31.	39.		31.
CU M	9.	30.	39.	39.		39.

STATION 1

C-27

180VH*

STATION 1, PLAN 1, RATIO 2
END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW		STORAGE	
4.	3.	5.	5.
3.	3.	4.	4.
2.	2.	3.	3.
2.	2.	3.	4.
3.	3.	4.	4.
2.	2.	4.	4.
3.	3.	4.	4.
2.	2.	4.	4.
3.	3.	4.	4.
5.	7.	5.	7.
13.	16.	11.	13.
19.	20.	87.	103.
19.	19.	154.	157.
19.	19.	154.	153.
3.	3.	6.	6.
2.	2.	4.	4.
2.	2.	3.	3.
3.	3.	3.	3.
2.	2.	4.	4.
3.	3.	4.	4.
5.	6.	5.	5.
12.	10.	29.	36.
19.	19.	149.	156.
19.	19.	157.	157.
19.	19.	150.	149.
5.	5.	5.	5.
4.	4.	4.	4.
3.	3.	3.	3.
4.	4.	4.	4.
4.	4.	4.	4.
4.	4.	4.	4.
7.	8.	7.	8.
45.	36.	45.	36.
152.	149.	152.	149.
156.	156.	156.	156.
140.	149.	140.	149.

*** 100 ***

PEAK OUTFLOW IS 20, AT TIME 48.00 HOURS

*** 100 ***

STATION 1

C-23

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CFS	20.	19.	17.	8.		1010.
CMS	1.	1.	0.	0.		29.
INCHES		.29	1.00	1.24		1.24
MM		7.31	25.35	31.58		31.58
AC-FT		10.	34.	42.		42.
THOUS CU YD		12.	41.	51.		51.

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(F)

[illegible]

C-24

PEAK OUTFLOW IS 286. AT TIME 43.50 HOURS

CFS
 CMS
 INCHES
 MM
 AC-FT
 THOUS CU H

PEAK
 286.
 8.
 5.
 2.51
 63.74
 84.
 104.

6-HOUR
 170.
 5.
 2.51
 63.74
 84.
 104.

24-HOUR
 1140.1
 1150.5
 1150.1
 1149.7
 1149.3
 1149.3

72-HOUR
 1140.7
 1151.0
 1150.1
 1149.7
 1149.3
 1149.3

TOTAL VOLUME
 2958.
 84.
 3.64
 92.46
 122.
 151.

1#0VF#

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(F)

	0.	100.	200.	300.	400.	500.	600.	700.	0.	0.	0.	0.
30	11											
1.00	21											
1.30	31											
2.00	41											
2.30	51											
3.00	61											
3.30	71											
4.00	81											
4.30	91											
5.00	101											
5.30	111											
6.00	121											
6.30	131											
7.00	141											
7.30	151											
8.00	161											
8.30	171											
9.00	181											
9.30	191											
10.00	201											
10.30	211											
11.00	221											
11.30	231											
12.00	241											
12.30	251											
13.00	261											
13.30	271											
14.00	281											
14.30	291											
15.00	301											
15.30	311											
16.00	321											
16.30	3301											
17.00	3401											
17.30	3501											
18.00	3601											
18.30	3701											
19.00	3801											
19.30	3901											
20.00	4001											
20.30	411											

C-27

CF8	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CHS	613.	327.	100.	42.	5073.	
INCHES	17.	9.	3.	1.	144.	
MM		4.83	5.92	6.24	6.24	
AC-FT		122.69	150.34	158.56	158.56	
THOUS CU M		162.	199.	210.	210.	
		200.	245.	259.	259.	

180VFS

STATION 1

		INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(I)									
		200.	300.	400.	500.	600.	700.	800.	900.	0.	0.
		100.	200.	300.	400.	500.	600.	700.	800.	900.	0.
0.	0.										
.30	11										
1.00	21										
1.30	31										
2.00	41										
2.30	51										
3.00	61										
3.30	71										
4.00	81										
4.30	91										
5.00	101										
5.30	111										
6.00	121										
6.30	131										
7.00	141										
7.30	151										
8.00	161										
8.30	171										
9.00	181										
9.30	191										
10.00	201										
10.30	211										
11.00	221										
11.30	231										
12.00	241										
12.30	251										
13.00	261										
13.30	271										
14.00	281										
14.30	291										
15.00	301										
15.30	311										
16.00	321										
16.30	330I										
17.00	340I										
17.30	350 I										
18.00	360 I										
18.30	370 I										
19.00	380I										
19.30	390I										
20.00	400I										
20.30	410I										
21.00	421										
21.30	431										
22.00	441										
22.30	451										
23.00	461										
23.30	471										
0.00	481										
.30	491										
1.00	501										

2.00 5201
 2.30 5301
 3.00 5401
 3.30 5501
 4.00 5601
 4.30 5701
 5.00 5801
 5.30 5901
 6.00 6001
 6.30 6101
 7.00 6201
 7.30 6301
 8.00 64.01
 8.30 65.01
 9.00 66.01
 9.30 67.01
 10.00 68.01
 10.30 69.01
 11.00 70.01
 11.30 71.01
 12.00 72.01
 12.30 73.01
 13.00 74.01
 13.30 75.01
 14.00 76.01
 14.30 77.01
 15.00 78.01
 15.30 79.01
 16.00 80.01
 16.30 81.01
 17.00 82.01
 17.30 83.01
 18.00 84.01
 18.30 85.01
 19.00 86.01
 19.30 87.01
 20.00 88.01
 20.30 89.01
 21.00 90.01
 21.30 91.01
 22.00 92.01
 22.30 93.01
 23.00 94.01
 23.30 95.01
 0.00 96.01
 30 97.01
 1.00 98.01
 1.30 99.01
 2.00 100.01
 2.30 101.01
 3.00 102.01
 3.30 103.01
 4.00 104.01
 4.30 105.01
 5.00 106.01
 5.30 107.01
 6.00 108.01
 6.30 109.01
 7.00 110.01
 7.30 111.01
 8.00 112.01
 8.30 113.01
 9.00 114.01
 9.30 115.01
 10.00 116.01

10.301171 0
11.001181 0
11.301191 0
12.001201 0

1800N8

STATION 1, PLAN 1, RATIO 5
END-OF-FERION HYDROGRAPH ORDINATES

OUTFLOW	
4.	4.
3.	3.
3.	3.
2.	2.
2.	3.
4.	4.
4.	4.
4.	4.
5.	5.
10.	10.
19.	19.
275.	275.
28.	28.
20.	20.

STORAGE	
6.	6.
5.	5.
4.	4.
3.	3.
7.	7.
9.	9.
24.	24.
144.	144.
188.	188.
164.	164.
157.	157.

STAGE	
1138.0	1138.0
1137.8	1137.8
1137.7	1137.7
1137.5	1137.5
1138.3	1138.3
1138.2	1138.2
1138.6	1138.6
1140.3	1140.3
1148.9	1148.9
1151.1	1151.1
1149.9	1149.9
1149.6	1149.6

PEAK OUTFLOW 18 910. AT TIME 42.00 HOURS

PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
910.	484.	144.	60.	7193.
26.	14.	4.	2.	204.
	7.15	8.49	8.85	8.85
	181.52	215.73	224.82	224.82
	240.	285.	297.	297.
	296.	352.	367.	367.

STATION 1

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(†)

	200.	400.	600.	800.	1000.	1200.	0.	0.	0.	0.	0.	0.
1.00 11
1.30 21
1.30 31
2.00 41
2.30 51
3.00 61
3.30 71
4.00 81
4.30 91
5.00 101
5.30 111
6.00 121
6.30 131
7.00 141
7.30 151
8.00 161
8.30 171
9.00 181
9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 331
17.00 3401
17.30 3501
18.00 3601
18.30 3701
19.00 3801
19.30 3901
20.00 401
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
0.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 5501
4.00 5601
4.30 5701
5.00 5801
5.30 5901

[illegible]

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW			
4.	4.	3.	3.
3.	3.	3.	3.
3.	3.	2.	2.
2.	2.	4.	5.
5.	5.	5.	5.
5.	5.	5.	6.
6.	7.	8.	10.
10.	11.	13.	15.
109.	1082.	1173.	14.
305.	253.	165.	936.
34.	20.	20.	86.
20.	19.	19.	20.
			19.
STORAGE			
6.	6.	5.	5.
5.	5.	4.	4.
4.	4.	4.	4.
4.	4.	5.	8.
9.	9.	8.	8.
8.	8.	9.	10.
11.	12.	15.	22.
31.	34.	45.	89.
172.	204.	221.	211.
191.	186.	177.	168.
164.	164.	162.	160.
157.	156.	154.	152.
			151.
STAGE			
1138.0	1138.0	1137.9	1137.9
1137.8	1137.8	1137.8	1137.7
1137.7	1137.7	1137.6	1137.6
1137.6	1137.6	1137.5	1138.3
1138.5	1138.5	1138.4	1138.4
1138.4	1138.4	1138.5	1138.6
1138.8	1138.9	1139.0	1138.7
1140.8	1141.1	1141.4	1140.1
1150.3	1151.9	1152.7	1145.6
1151.3	1151.0	1150.8	1151.5
1150.0	1149.9	1149.9	1150.1
1149.6	1149.6	1149.5	1149.7
			1149.2

PEAK OUTFLOW IS 1173. AT TIME 42.00 HOURS

PEAK	4-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
1173.	639.	188.	78.		9317.
33.	18.	5.	2.		264.
	9.44	11.08	11.46		11.46
	239.70	281.32	291.18		291.18
	317.	372.	385.		385.
	391.	459.	475.		475.

180VFS

STATION 1

INFLW(I), OUTFLOW(O) AND OBSERVED FLOW(F)			
0.	200.	400.	600.
.30	11	800.	1000.
1.00	21	1200.	1400.
			0.
			0.
			0.
			0.

1.30 31
2.00 41
2.30 51
3.00 61
3.30 71
4.00 81
4.30 91
5.00 101
5.30 111
6.00 121
6.30 131
7.00 141
7.30 151
8.00 161
8.30 171
9.00 181
9.30 191
10.00 201
10.30 211
11.00 221
11.30 231
12.00 241
12.30 251
13.00 261
13.30 271
14.00 281
14.30 291
15.00 301
15.30 311
16.00 321
16.30 331
17.00 341
17.30 351
18.00 361
18.30 371
19.00 381
19.30 391
20.00 401
20.30 411
21.00 421
21.30 431
22.00 441
22.30 451
23.00 461
23.30 471
0.00 481
.30 491
1.00 501
1.30 511
2.00 521
2.30 531
3.00 541
3.30 551
4.00 561
4.30 571
5.00 581
5.30 591
6.00 601
6.30 611
7.00 621
7.30 631
8.00 641
8.30 651
9.00 661
9.30 671
10.00 681

STATION 11

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

[illegible]

FLAHERTY-GIAVARA ASSOCIATES NEW HAVEN CT

NATIONAL DAM SAFETY PROGRAM, LITTLE CHOCONUT WATERSHED SITE 2A --ETC(U)
JUN 81 H C FLAHERTY DACW51-81-C-0006

DACW51-B1-C-0006

NL

2 of 2

$$\Delta(\Gamma) = \Delta$$

END

DATE _____

FILMED

11.8

.50	1147.57	0.00	157.	20.	0.00	48.00	0.00
.30	1151.20	0.00	189.	286.	0.00	43.50	0.00
.40	1152.04	0.00	206.	413.	0.00	42.50	0.00
.50	1152.48	0.00	215.	910.	0.00	42.00	0.00
.60	1152.88	0.00	224.	1171.	0.00	42.00	0.00
.70	1153.20	0.00	231.	1387.	0.00	42.00	0.00
.80	1153.50	0.00	237.	1590.	0.00	42.00	0.00
1.00	1154.10	0.00	250.	1990.	0.00	42.00	0.00

 FLOOD HYDROGRAPH PACKAGE (HEC-1)
 DAN SAFETY VERSION JULY 1978
 LAST MODIFICATION 26 FEB 79

APPENDIX D

PREVIOUS INSPECTION REPORTS/AVAILABLE DOCUMENTS

DESIGN REPORT

LITTLE CHOCONUT, FINCH HOLLOW,
AND
TROUT BROOK WATERSHED PROTECTION PROJECT

DESIGN REPORT

SITE 2A

BROOME COUNTY, NEW YORK

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

November 1966

DESIGN SECTION, SYRACUSE, N.Y.

This floodwater retarding structure is located on Little Chocanut Creek approximately 0.15 miles northwest of Chocanut Center, New York. Sheet 4 of this report, together with the Castle Creek, N.Y. 7.5' quadrangle published by the U. S. Geological Survey, may be used to locate this structure.

A summary of pertinent design information is given on Sheet 2 of this report.

Criteria and procedures used in this design are given in Soil Conservation Service publications.

This is one of eight proposed floodwater retarding dams in the Little Chocanut, Finch Hollow, and Trout Brook Watershed designed to reduce floodwater damages. It will retard a 100-year frequency storm without discharge occurring in the emergency spillway.

The results of hydrologic and hydraulic computations are given on Sheet 3 of this report.

The structure consists of a homogeneous compacted earth fill of glacial till with a cutoff trench into a foundation primarily of glacial till and glacial lacustrine material overlying bedrock. A drainage system is located under the downstream portion of the earth fill to control the phreatic surface and provide a safe outlet for foundation seepage.

The principal spillway is a drop inlet structure consisting of a single stage reinforced concrete riser, a 24 inch diameter reinforced concrete water pipe, and a channel excavated into bedrock at the outlet end of the conduit.

The emergency spillway is designed as an earth cut with vegetation in the left abutment.

U S DEPARTMENT OF AGRICULTURE — SOIL CONSERVATION SERVICE

DESIGN REPORT SUMMARY

I. Watershed data

A. Structure class	C
B. Drainage area	406 Ac
C. Time of concentration - T_c	0.50 hrs
D. Hydrologic curve number - C_n Moisture Condition II	63

II. Principal spillway

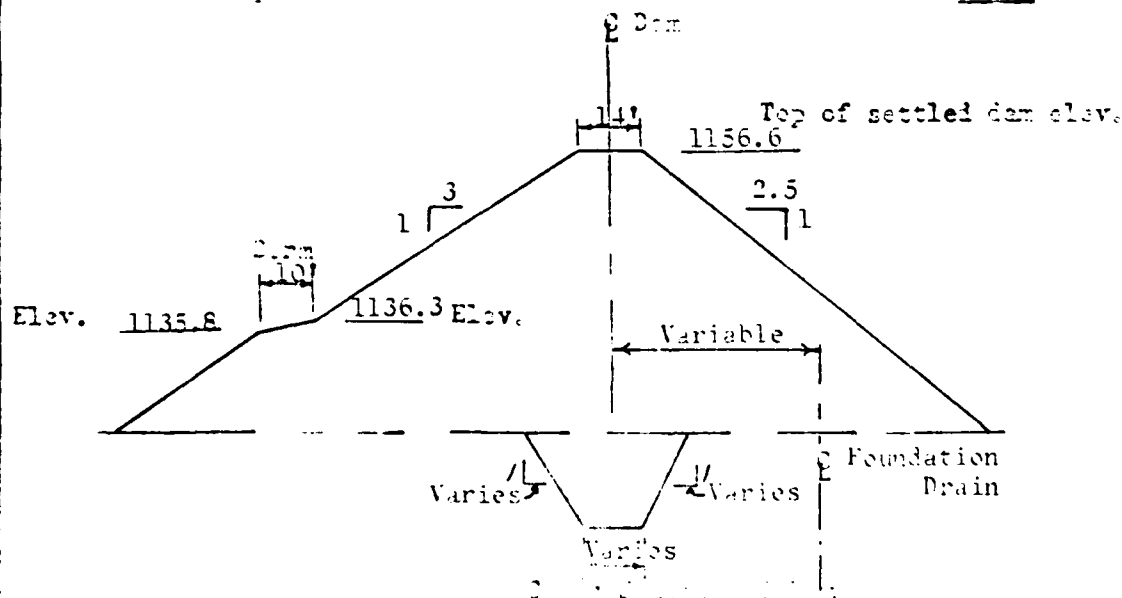
A. Conduit	
1. Size (I.D.)	24 In.
2. Length	164.33 Ft.
B. Riser	
1. Size	2.5x2.5 Ft.
2. Height (floor to orifice crest)	6.4 Ft.
C. Orifice size	1.17x1.0 Ft.
D. Reservoir drain pipe	6 In.
E. Type of energy dissipator	Bedrock channel

III. Emergency spillway

A. Width	80.0 Ft.
B. Side slopes	3:1
C. Length of level section	30 Ft.
D. Exit slope	0.033 Ft./Ft.
E. Maximum velocity - in exit section (LSH)	5.9 Ft./Sec.
F. Duration of flow (ESH) through emergency spillway	0.34 Hrs.
G. Frequency of use	100 yrs.

IV. Earth fill

A. Height	27 Ft.
B. Volume	30,000 C.Y.
C. Compaction	Class A



U.S. DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

Element of Structure	Determining Factor	Elevation	Surface Area Acres	Storage		Inflow		Peak Outflow (c.f.s.)
				Acre-Feet	Inches ^a	Volume Inches	Rate (c.f.s.)	
Crest of Orifice	50 year submerged sediment accumulation	1136.8	4.0	$\frac{1}{8}$	0.24			
Crest of emergency spillway	100 yr. frequency storm Moisture Condition II	1149.9	19.2	$\frac{2}{155}$	4.58			20
Design high water	1.00 x value from ^{**} ES 1020 Sheet 4 of 5 Moisture Condition II	1151.7	20.6	$\frac{2}{192}$	5.67	7.22	1,804	388
Top of Dam	1.00 x value from ^{**} ES 1020 Sheet 5 of 5 Moisture Condition II	1156.6	24.3	$\frac{2}{302}$	8.93	21.00	5,653	3,660

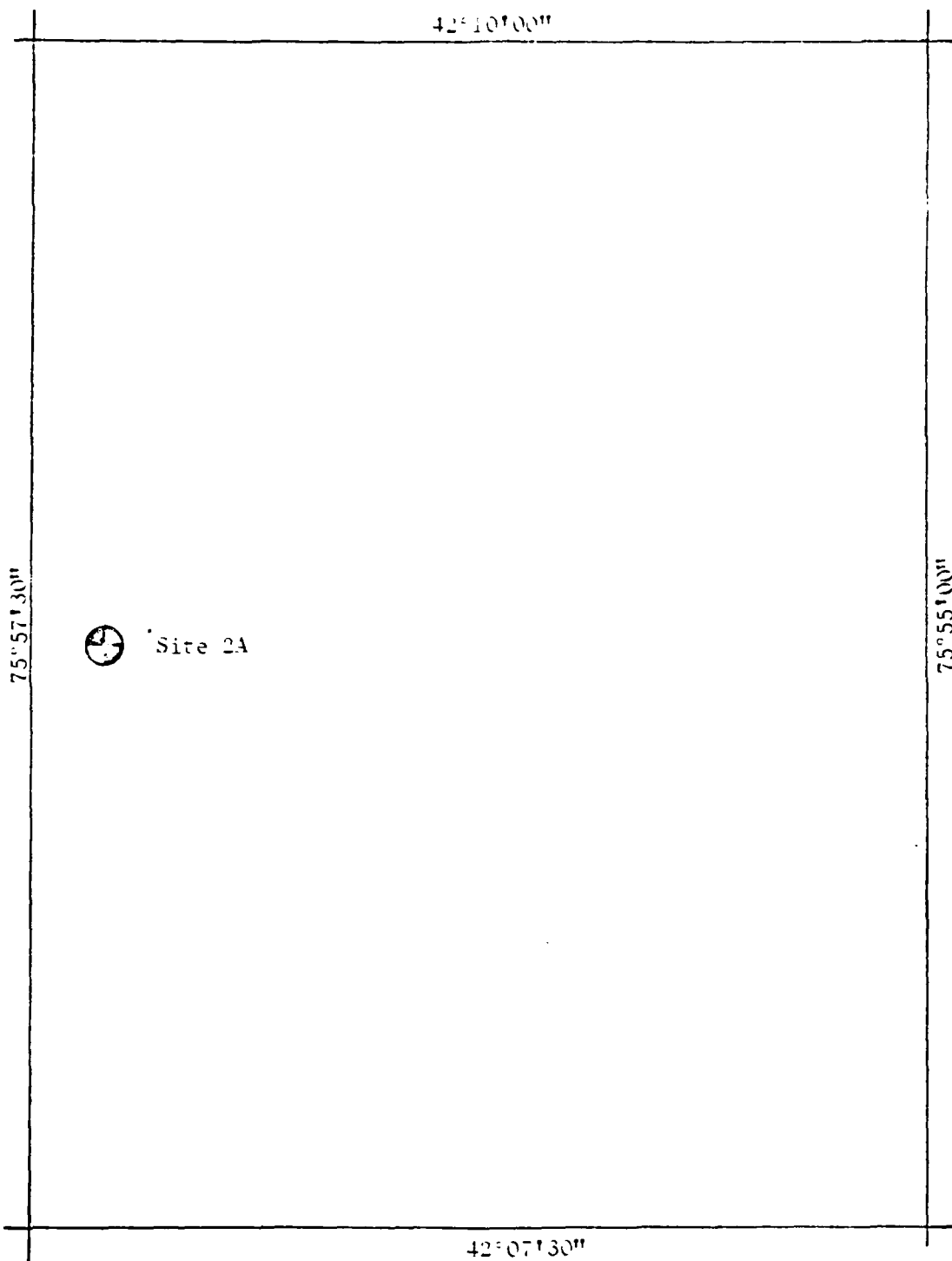
*Volume expressed in inches of runoff from controlled area of 406 acres.

^{**}Hydrologic criteria in National Engineering Memorandum 56S-27 (Rev. 1).

Time required to empty temporary storage = 83 percent of storage drawdown in 10 days.

$\frac{1}{1}$ Storage allocated to sediment pool.

$\frac{2}{2}$ Does not include 19 ac.ft. of sediment.



Reference: USGS 7.5' Quad. 1:24,000

CASTLE CREEK, NEW YORK

U S DEPARTMENT OF AGRICULTURE — SOIL CONSERVATION SERVICE

Information pertaining to the criteria and procedures referred to in this report may be obtained from Mr. Wallace L. Anderson, State Conservationist, USDA, Soil Conservation Service, State Office, New York.

Loring C. Whitson
District Engineer

W. S. Atkinson
State Conservation Engineer

DESIGN SECTION, SYRACUSE, N. Y.

SLOPE STABILITY ANALYSIS

SUMMARY - SLOPE STABILITY ANALYSIS

240

ANALYZED AT:

APPROVED BY

REMARKS

SOURCE AND USE OF MATERIALS		CLASSIFICATION	ADOPTED DESIGN DATA					REMARKS	
			γ_d (pcf)	γ_m (pcf)	γ_{sat} (pcf)	γ_{sub} (pcf)	ϕ (deg)	$\tan \phi$	c (psi)
①	Hot 51-A Found.	LC	97.5	126.5	126.5	21.0	27.0°	0.510	200
②	Emul. Spvy. Emb. 51-A	GC	126.0	136.5	143.5	21.0	19.2°	0.334	750
③									
④									
⑤									
⑥									
⑦									
⑧									
TRIAL NO.		SLOPE	CONDITIONS						
Sp 1	3:1		Maximum Section Full drawdown - No berm - Arc cut from app. slope, then Emb. only of Mat. 1						
On 2	2 1/2:1		No drawdown - No berm - Arc cut from app. slope, then Emb. only of Mat. 1						

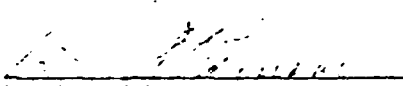
D-7

GEOLOGY REPORT

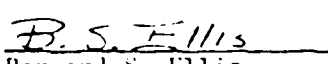
GEOLOGY REPORT

SITE 2-A
LITTLE CHOCONUT WATERSHED
UNION TOWNSHIP
NEW YORK

APPROVAL:


W. S. Atkinson
State Conservation Engineer

PREPARED BY:


Bernard S. Ellis
Geologist

REFERENCE:

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

D-8

DRAWING NO.

NY-2016-G

SHEET / OF

DATE 2/66

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

GENERAL

State New York County Broome S. Sec. 1 T. 1 R. 1 Watershed L Choconut Creek
 Project WP-08 Site number 2-A Structure C
 Investigator B. S. Ellis Geologist Backhoe, Drill Rig Date 10/65

SITE DATA

Length of dam 0 63 feet 403 Type of structure Earth Fill Purpose Floodwater Retarding
 Direction of flow Southeast Maximum height of fill 26.6 feet 530
 Estimated volume of storage 24,000 cubic yards

STORAGE ALLOCATION

	Volume (cu yds)	Surface Area (acres)	Depth (feet)
sediment	19.0	4.0	4.8
floodwater	155.0	19.2	14.9

SURFACE GEOLOGY AND PHYSIOGRAPHY

Physiographic description Appalachian Plateau Topography Steep NW-40'/mile
 Steepness of abutments: Left 9 percent, Right 23 percent. Width of floodplain at centerline of dam 160 feet
 General geology of site: This site is located approximately 2 miles due north of Johnson City, New York. Drainage in this area flows southerly to the Susquehanna River, situated 4 miles SW of the site.

The topography in the area ranges from an elevation of 800' in the Susquehanna River to 1600' on some of the higher hills. Glacial action, while not having a greatly modifying effect on the topography, has had a smoothing tendency. Glacial lacustrine deposits in the valleys have decreased the pre-glacial relief. Scour & ablation of the ridge tops was slight, as the ice sheet was thin in this area. The outer limit of continental glaciation was only about 40 miles south of Binghamton.

The underlying bedrock is Upper Devonian in age and is almost exclusively shales & siltstones of the Catskill Delta. This site is situated on the southeast limb of the Horseheads Syncline. This syncline is one of a series of gently undulating folds that trend west and then southwest across the southern tier of counties in New York State. They are related to the intensely folded belt of the Appalachians and gradually disappear as a series of low, gentle swells to the north.

(2)

SURFACE GEOLOGY (continued)

Historically, the site appears to have experienced some glacial scour of the valley bottom and southwest abutment. Subsequent melt waters deposited silts and clays in the valley bottom. These probably represent a northwesterly extension of a glacial lake formed in the Choconut and Susquehanna valleys. Till, associated with the glacial advance, mantles the rest of the site.

10-59

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

FEATURE Centerline of Dam

(Centerline of Dam, Principal Spillway, Emergency Spillway, the Stream Channel, Investigations for Drainage of Structure, Borrow Area, Reservoir Basin, etc.)

DRILLING PROGRAM

Equipment Used	Number of Holes		Number of Samples Taken		
	Exploration	Sampling	Undisturbed (state type)	Disturbed Large	Small
Backhoe	4	—	—	—	—
Drill Rig	5	5	2 - Shelby	—	31 (Jar)
			17' of NX Core		
Total	9	5	—	—	31 (Jar)

SUMMARY OF FINDINGS (include only factual data)

The left abutment of this site is a fairly uniform, dense glacial till down to the vicinity of D.H. 51. At this location, the till is underlain by silts & clays of relatively low density.

In the flood plain, the till is apparently absent in the upper section of the profile. (The present impoundment of water prevented any drilling in a section approximately 160' in length along the C/L.)

In the lower right abutment, the silts and clays are present in the entire profile down to a depth of 20'. Higher up the abutment, bedrock is within 6' or 7' of the surface and is overlain by till. At elevations above the top of dam, the bedrock appears to be at or near the surface.

There were no materials encountered along the C/L that would be considered permeable.

The bedrock in the right abutment is an interbedded siltstone and shale. The upper 2' or so is weathered to a moderate degree. The column in general shows about 80% bedded 1"-3" thick and fairly soft. The remaining 20% is an average of 4"-6" thick and considerably more competent. A set of joints oriented approximately north-south is well developed in this area. An east-west set is less well developed.

The bedrock surface drops off steeply under the flood plain to an unknown depth.

10-59

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

FEATURE Principal Spillway

(Centerline of Dam, Principal Spillway, Emergency Spillway, the Stream Channel, Investigations for Drainage of Structure, Borrow Area, Reservoir Basin, etc.)

DRILLING PROGRAM

Equipment Used	Number of Holes		Undisturbed (state type)	Number of Samples Taken	
	Exploration	Sampling		Disturbed Large	Small
Backhoe	1	—	—	—	—
Drill Rig	3	3	6' of NX Core	—	8 (Jar)
Total	4	3	—	—	8 (Jar)

SUMMARY OF FINDINGS

(include only factual data)

Bedrock underlies the C/L of the principal spillway at varying depths. Depending on final location of the pipe, the depth will range from 5.7 ft. to 10.5 ft.

The material overlying the bedrock is approximately 4' of silt (ML) and 4' of clay (CL) at the location of T.P. 301. Downstream toward the C/L of dam and the outlet structure, these materials grade into a mixture of alluvial and lacustrine deposits.

10-59

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

FEATURE Emergency Spillway

(Centerline of Dam, Principal Spillway, Emergency Spillway, the Stream Channel, Investigations for Drainage of Structure, Borrow Area, Reservoir Basin, etc.)

DRILLING PROGRAM

Equipment Used	Number of Holes		Number of Samples Taken		
	Exploration	Sampling	Undisturbed (state type)	Disturbed Large	Small
Backhoe	4	1	—	1	—
Total	4	1	—	1	—

SUMMARY OF FINDINGS

(include only factual data)

The emergency spillway excavation will be entirely in a fairly uniform glacial till. Bedrock was not encountered in any of the test pits, some of which were carried to 3' below design grade.

Several sandy streaks were noted in this till, and a minor amount of seepage was present in these sands.

10-53

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

FEATURE

Borrow Area

(Centerline of Dam, Principal Spillway, Emergency Spillway, the Stream Channel, Investigations for Drainage of Structure, Borrow Area, Reservoir Basin, etc.)

DRILLING PROGRAM

<u>Equipment Used</u>	<u>Number of Holes</u>		<u>Number of Samples Taken</u>		
	<u>Exploration</u>	<u>Sampling</u>	<u>Undisturbed (state type)</u>	<u>Disturbed Large</u>	<u>Small</u>
Backhoe	5	2	—	2	—
Total	5	2	—	2	—

SUMMARY OF FINDINGS

include only 'actual data)

A supplemental borrow area was investigated on the left abutment. This area extends from approximately 200' to 600' upstream from the C/L extension on the left side of the dam, and is contiguous with the emergency spillway.

Most of the borrow area is underlain by glacial till to a depth of 8' or 9'.

The same sandy streaks discussed under "Emergency Spillway" exist in this area.

... The lower corner of the area, in the vicinity of T.P. 102, is till overlain by a mottled brown and gray silt.

It is estimated that there are in excess of 12,000 cu. yds. of suitable fill material available from this borrow area.

13-59

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

FEATURE	Miscellaneous
1. <u>General Information</u>	
2. <u>Administrative</u>	
3. <u>Financial</u>	
4. <u>Legal</u>	
5. <u>Medical</u>	
6. <u>Other</u>	

(Centerline of Dam, Principal Soilways, Emergency Spillways, the Stream Channel, Investigations for Drainage of Structure, Borrow Area, Reservoir Basin, etc.)

DRILLING PROGRAM

Equipment Used	No. of Samples		Number of Samples Taken	
	Undisturbed	Disturbed	Undisturbed	Disturbed
	(state type)	(state type)	Large	Small
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
Total	_____	_____	_____	_____

SUMMARY OF FINDINGS

include only 'actual data'.

Drain Line

Inaccessibility prohibited an extensive investigation of the drain line. One hole (D.H. 54) was drilled at the approximate location of the drain.

Water Supply

This stream has a rather low base flow, largely due to the small drainage area with open fields. It will probably be necessary, depending on the time of year of course, to provide for a steady supply of water with an upstream sump and auxiliary dam.

Other Materials

There is no suitable riprap material available on this site.

Natural drainage materials are also absent or occur in locations that do not make them readily available.

SOILS CORRELATION TABLE
AND
ESTIMATED AVAILABLE BORROW QUANTITIES

Watershed L. Choconut Creek Site No. 2-A State N.Y. Prepared By B. S. Ellis Date 2/66

Sample

51.9

51.16

51.21*

These samples were taken to provide data on the silts and clays logged in the floodplain. They represent the range in properties that exist in these materials.

54.6*

This sample was taken to provide lateral correlation of the silts logged in the floodplain.

103.1

104.1

These samples are representative of the till logged in the supplemental borrow area. They represent 12,000 cu. yds. of material.

203.1

This sample is representative of the till logged in the emergency spillway and should be comparable to the borrow area material.

* Processed in SCS State lab, Syracuse, New York

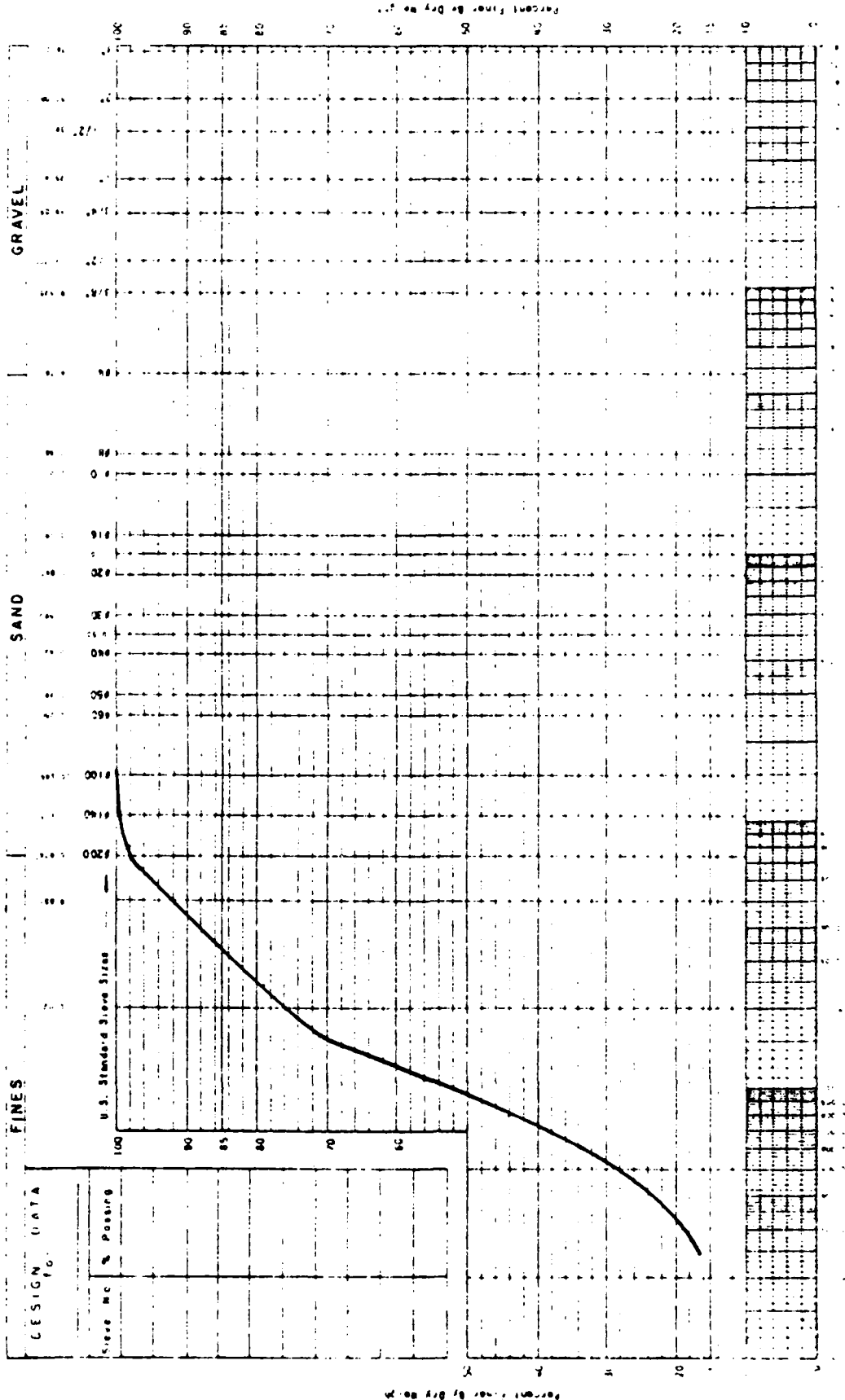
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

HOLE 51, SAMPLE 9 (12'-13.5')

GRAIN SIZE DISTRIBUTION GRAPH

Location BROOME CO.

Project LITTLE CHOCONUT SITE 2-A



ML LL-26, PI-3

G/S 921043

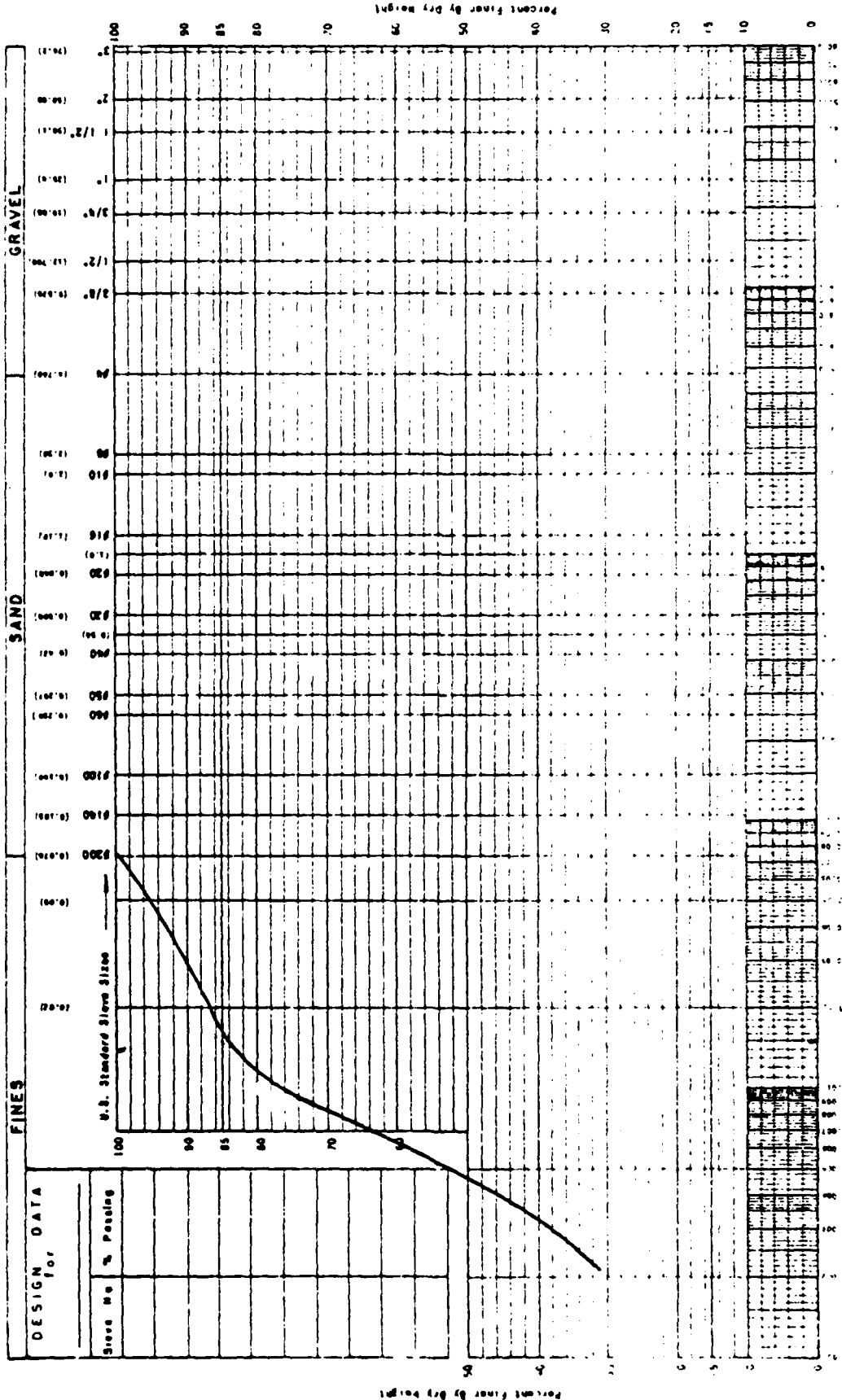
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

HOLE 51, SAMPLE 16 (23'-24.5')

GRAIN SIZE DISTRIBUTION GRAPH

Location BROOME CO.

Project LITTLE CHOCONUT SITE 2-A



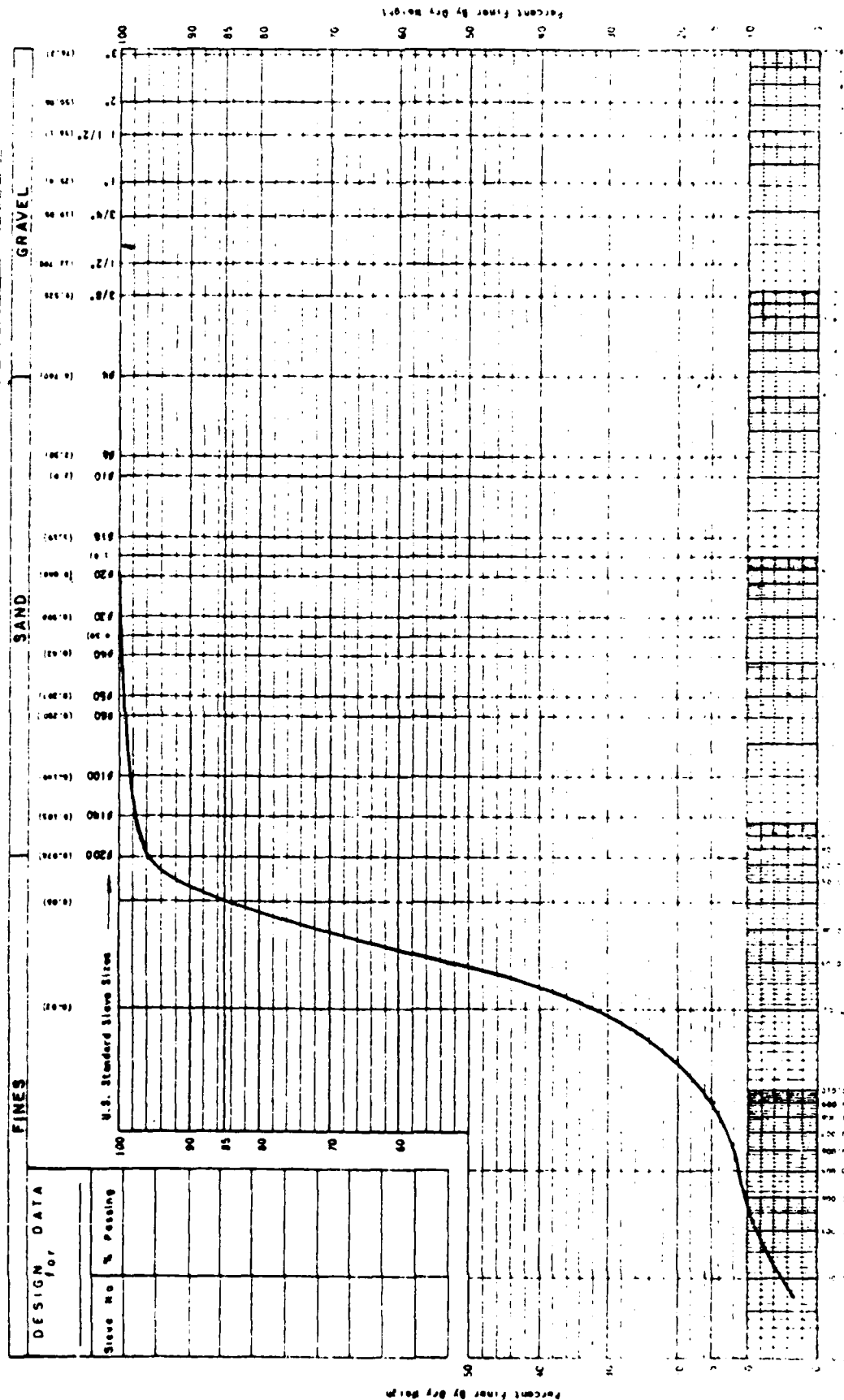
CL-ML LL-29, PI-7

65-21843

HOLE 51, SAMPLE 21 (39'-40.5')

Project	LITTLE CHOCONUT	SITE 2-A	GRAIN SIZE	DISTRIBUTION	GRAPH	Location
Project LITTLE CHOCONUT SITE 2-A						

Location **BROOME CO.**



ML NO LIMITS RUN

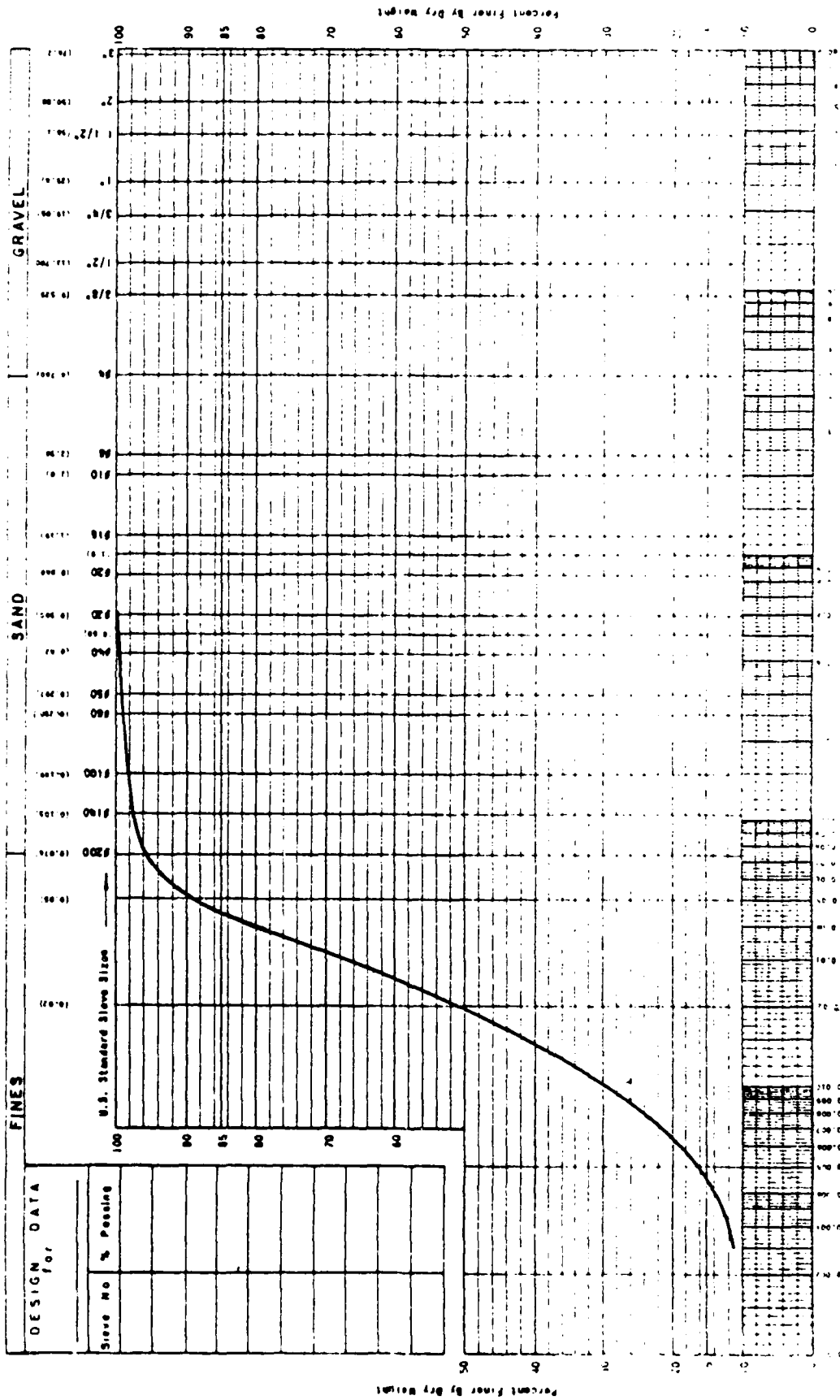
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

HOLE 54, SAMPLE 6 (30'-31.5')

GRAIN SIZE DISTRIBUTION GRAPH

Location BROOME CO.

Project LITTLE CHOCONUT SITE 2-A



10-69

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

State New York County Broome Watershed L. Choconut Subwatershed _____
Site number 2-A Site group _____ Structure class C Investigated by B. S. Ellis, Geologist Date 10/65
(signature and title)

INTERPRETATIONS AND CONCLUSIONS

Centerline of Dam

The left abutment of this site, from the emergency spillway down to about D.H. #51, should present no problems. The till is dense to very dense and it is uniform. The streaks, or lenses, of sand logged in some areas of this till will present no problems of seepage or piping. Little or no seepage was observed in these pits in this area.

In the floodplain, silts and clays are logged to a depth in excess of 40'. With the exception of a zone from 7' to 12', and below 30', the blow count is pretty much under 20 blows/ft. in this material.

On the right abutment, the silts and clays phase out into glacial till overlying the bedrock.

Consolidation of the silts and clays (and it should be brought out here that the clay logged in this floodplain is actually an ML-CL - see D.H. 51, Sample 16, on page 11 of this report) is, of course, a consideration in the design of this embankment. Because of this, I obtained two Shelby samples that should be representative of the shear strength of this material. It is my feeling that differential settlement will not be a real problem. However, lab tests will either confirm or refute this.

As shown on the plan view, an old earth dam is located just downstream from the C/L of this structure. I recommend that all of this material, as shown on the plan view, be removed. I also suggest that the best thing would be to spoil it downstream from the structure by spreading.

There seems to be little real need for a cutoff through the floodplain section if a good job of scalping is done to get rid of the old fill and any material that may have accumulated in the bottom of the existing pond. A root zone cutoff could be used in the left abutment in the till. In the right abutment, the cutoff should be carried down to fairly unweathered rock. We will not be able to reach a good solid rock at this site. In fact, most of the rock in this entire area is a thin bedded shale and siltstone and is somewhat friable.

In order to establish some sort of a basis for installing a cutoff on this C/L, the following depths at the various T.P. and D.H. locations are suggested:

T.P. 1 - 3'	T.P. 3 - 7'
D.H. 51 - 6'	D.H. 53 - 9'-10'
T.P. 2 - 8'	T.P. 4 - 9'-10'
D.H. 52 - 6'	

Between T.P. 2 and D.H. 52, the cutoff should probably extend down to the top of the "C" horizon.

A profile along the drain line location is shown on page 18 of this report. The sieve analyses for samples #9 and #16 from D.H. 51 can be used as a basis for design.

10-59

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

State New York County Broome Watershed L. Choconut Subwatershed _____
Site number 2-A Site group _____ Structure class C Investigated by _____ Geologist Date 10/65
(signature and title)

INTERPRETATIONS AND CONCLUSIONS (continued)

Principal Spillway

The location of the principal spillway appears to be a little bit critical on this site.

In order to get a foundation on either abutment, the riser will have to be located above a ground elevation of 1136. This will require the excavation of a channel into the abutment to provide pond drainage, if required.

The most feasible location appears to be in the area delineated by a line through TP 301 and D.H. 352. The bedrock surface is fairly uniform along the extent of the pipe, as shown on the principal spillway profile. Excavation depth will be a fairly uniform 10' at this location. Moving the pipe about 20' laterally up the abutment would result in a trench depth of 6'-7'.

The top foot or so of the bedrock is weathered quite badly. This should, of course, be removed.

Emergency Spillway

The emergency spillway excavation is a moderately uniform glacial till.

There is approximately 5% +6" material in this till. It consists of fairly tough flaggy cobbles that will probably not break down with normal compaction equipment.

As indicated earlier, streaks or lenses of sandier material occur in this till. They are carrying water, but I suspect that they are discontinuous in nature. As such, they may bleed for a while on the outside cut of the spillway, but should dry up. In any event, I don't believe they are well defined enough to warrant designing drainage for the outside edge of the spillway. In the event some of them discharge quite regularly, it shouldn't be too much of a job to correct the situation.

I believe it will be necessary to flare the outer edge of the spillway to blend in with the borrow area. We do not have a great excess of suitable material available on this site. If the spillway is hooked around as shown and the borrow area excavated separately, a lot of material will be unavailable. In addition to this, it would make a lot of sense from a construction standpoint to cut this all down at once. I have shown the proposed layout with a dashed line on the plan view.

Borrow Area

Supplemental borrow is available upstream from the emergency spillway. Excavation of this material was discussed to a certain extent in the spillway narrative.

10-59

DETAILED GEOLOGIC INVESTIGATION OF DAM SITES

State New York County Broome Watershed L. Chocoma Subwatershed _____
Site number 2-A Site group _____ Structure class C Investigated by _____ Geologist Date 10/65
(signature and title)

INTERPRETATIONS AND CONCLUSIONS (Continued)

Borrow Area (Continued)

The till in the SW corner of this area in the vicinity of TP-102 and probably in general below the 1148 contour, is overlain by lacustrine silts. In order to use this, the overlying silts will have to be removed. There is sufficient material available above this area, so I suggest that borrowing operations be confined to the higher elevation.

This borrow material is a uniform GM with approximately 35-40% fines. Some sandy streaks do exist, but they are limited enough so that they can readily be mixed in with the main body of till. As indicated in the Soils Correlation Table, there are in excess of 12,000 cu. yds. available.

SOILS ANALYSES

W.L. Anderson

UNITED STATES GOVERNMENT

Memorandum

TO : W. S. Atkinson, State Conservation Engineer, SCS, Syracuse, New York 13210

DATE: April 20, 1966

FROM : Roy A. Decker, Head, Soil Mechanics Laboratory, SCS, Lincoln, Nebraska 68508

SUBJECT: ENG 22-5, New York WT-08, Little Choconut Creek, Site No. (Broome County)

ATTACHMENTS

1. Form SCS-354, Soil Mechanics Laboratory Data, 1 sheet.
2. Form SCS-128 & 128A, Consolidation Test Data, 1 Test 2 sheets.
3. Form SCS-127, Soil Permeability, 1 sheet.
4. Form SCS-355, Triaxial Shear Test, 2 sheets.
5. Form SCS-352, Compaction and Penetration resistance, 3 sheets.
6. Form SCS-129, Undisturbed Sample Characteristics, 1 sheet.
7. Form SCS-357, Summary - Slope Stability Analysis, 2 sheets.
8. Investigational Plans and Profiles

DISCUSSION

FOUNDATION

- A. Classification The foundation materials at this site consist primarily of glacial till and glacial lacustrine material overlying bedrock. There is an existing embankment downstream from the proposed centerline, and there is up to 9' of fill and rubble and some very low density silt at the surface, resulting from this dam.

Shale bedrock occurs at depths of from 5 to 10 feet on the right abutment. The shale was encountered at a depth of 14.5', near base of the right abutment. It was not encountered in any of the other borings on the left side of Drill Hole No. 52. Drill Hole No. 51, at the base of the left abutment, penetrated lacustrine sediments to a depth of 40.5'.

The glacial till is a GC or GM material that contains slightly less than 50% fines. The lacustrine material is a fine-grain CL or ML. The material in the core samples was all finer than the 0.05 mm size. The liquid limits were in the range of 30 and the plasticity indices were less than 10.

- B. Density: The till is described as a dense till. The lacustrine sediments represented by the cores submitted have densities in the range of 1.52 g/cc to 1.61 g/cc. This is a relatively dense

2 -- W. S. Atkinson -- 4/20/66

Rey S. Decker

Subj: ENG 22-5, New York WP-08, Little Choconut Creek, Site No. 2-A

for materials with this degree of fineness.

- C. Shear Strength: A triaxial shear test was made on Sample 66W2345 to represent the lacustrine material. The natural water content of the core was at theoretical saturation. The core had a variable density, and the failure planes of the test specimens indicate the probability of fissures, consequently, the failure envelope is not tangent to all circles. The consolidated, undrained, strength values of $\phi = 27^\circ$ and $c = 850$ psf were chosen to represent the strength parameters of the two lower density test specimens. The unconsolidated, undrained strength, indicated by the unconfined compression test, is $c = 2100$ psf.
- D. Consolidation: A consolidation test was made on Sample 66W2345. The lacustrine material is preconsolidated as indicated by both the shear test and the consolidation test. The minimum p_c indicated for a loading range through 16,000 psf is approximately 3000 psf. Based on the unconfined compressive strength of Sample 66W2345, the preconsolidation stress is undoubtedly greater than 3000 psf. Consequently, the consolidation potential is expected to be low. We estimate a consolidation potential of slightly over 1% for the lacustrine silt. The overall consolidation potential in the vicinity of Drill Hole 51 is not expected to exceed 0.4'.
- E. Permeability: Permeability measurements were made on the consolidation test specimen. The data indicates that the vertical permeability at sample depth is in the range of 0.01 ft./day.

EMBANKMENT

- A. Classification: The borrow material from the emergency spillway and from the borrow area is glacial till, classed as GC and GC-GM. The till contains about 30% gravel. It has a liquid limit in the range of 25 to 30 and a plasticity index of less than 10. From 31% to 66% of the material is finer than the $3/4"$ size.
- B. Compacted Density: Standard Proctor compaction tests were made on the minus #4 fraction of the three borrow samples. The compacted density obtained ranged from 118.5 pcf to 121.5 pcf.
- C. Shear Strength: A triaxial shear test was made on Sample 66W2347 to represent the materials submitted. A consolidated, undrained test was made on saturated soil compacted to 95% of standard Proctor density. The shear strength values have been interpreted as $\phi = 19^\circ$, $c = 750$ psf. These values are suggested for design.

SLOPE STABILITY

The stability of the proposed 3:1 upstream and 2:1^{1/2} downstream slope was

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Ray S. Decker

Subj: ENG 22-5, New York WP-08, Little Choconut Creek, Site No. 2-A

checked with a Swedish circle method of analysis. The foundation below approximate elevation 1236 consists of a zone of stiff clay that contains flaggy cobbles scattered throughout the matrix. The preconsolidated lacustrine material, represented by the core samples, directly underlies the stiff clay zone described above. Based on blow count, description, and the test data obtained on the core samples, we assumed that foundation below elevation 1236 was strong enough to limit the failure surfaces to the embankment. A 28' high embankment with a 3:1 upstream slope and a 2 1/2:1 downstream slope was analyzed. The strength values used for the embankment were $\phi = 19^\circ$, $c = 750$ psf. The factors of safety obtained were greater than 2.5. A summary of the analysis is attached.

SETTLEMENT STRAINS

The consolidation potential of the till and the lacustrine material is very low, therefore, differential settlement should not be a problem, provided that the old dam and the associated low density sediments are removed, as suggested in the geology report.

RECOMMENDATIONS

- A. Site Preparation: We concur with the geologist's suggestion to remove the old earth dam that is located just downstream from centerline. Recent sediments, resulting from the existing dam, should also be removed from the embankment area. Normal site preparation should be adequate for the rest of the area.
- B. Cutoff: We concur with cutoff trench suggested in the geologic report and shown on the attached Form SCS-35B. The proposed trench will bottom in the shale below the contact zone on the right abutment. In the floodplain and on the left abutment, the trench should bottom below the root zone and the zone affected by surface weathering.

The trench backfill may consist of the glacial till represented by the samples submitted. The backfill should be compacted to a minimum of 95% of standard Proctor density with the control based on the minus #4 fraction. We suggest control on the minus #4 fraction here to assure uniformity.

- C. Principal Spillway: The proposed location is on the lower portion of the right abutment. Bedrock occurs at a relatively uniform depth of about 8' to 10' in this area. The bedrock is mantled with lacustrine material, and it appears that the stiff clay that contains flaggy cobbles will occur at grade throughout much of the trench. If the cobble content is high, it may be desirable to overexcavate and backfill the trench with compacted material. In either case, the conduit will be bedded in close proximity to the bedrock. The consolidation potential under the conduit will probably not exceed 2%.

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Rey S. Decker

Subj: ENG 22-5, New York WP-08, Little Choconut Creek, Site No. 2-A

The conduit could possibly be shifted to the right, as indicated in the geologic report, and bedded directly on shale.

- D. Drain: A drain is recommended to provide a safe outlet for seepage that bypasses the cutoff trench. We suggest a trench drain with a pipe outlet located at about $c/b = 0.6$. The drain trench should penetrate the foundation to a minimum depth of 5', and it should extend up the abutments to normal pool elevation.

The lacustrine material is a fine grain soil that does not require a special filter gradation. The till contains approximately 15 % of 0.005 mm size material, and the plasticity index is less than 10. Both of these values indicate a material that is moderately susceptible to piping. Therefore, we recommend that ASTM fine concrete aggregate or a sand of comparable gradation be used in conjunction with a coarse filter, such as ASTM No. 78 road gravel. The fine filter should, of course, be placed adjacent to the till and the embankment material.

E. Embankment Design: The following are recommended:

1. Placement of materials: A homogeneous embankment of glacial till is recommended. The till represented by the samples submitted is quite uniform, and the density may be controlled on either the minus #4 fraction, or on the minus 3/4" fraction. The till should be placed at a minimum of 95% of standard Proctor for either method of control.
2. Slopes: The proposed 3:1 upstream and 2 1/2:1 downstream slopes have acceptable factors of safety and are recommended.
3. Settlement: An overfill allowance of 0.75' is recommended to compensate for residual settlement in the fill and foundation.

Prepared by:

Lorn P. Dunnigan
Lorn P. Dunnigan

Reviewed and Approved by:

Rolland B. Phillips
Rolland B. Phillips

Attachments

cc: W. S. Atkinson
H. M. Kautz, Upper Darby, Pennsylvania
Bernard S. Ellis, Syracuse, New York
W. L. Anderson, Syracuse, New York
R. J. McClimans, Binghamton, New York

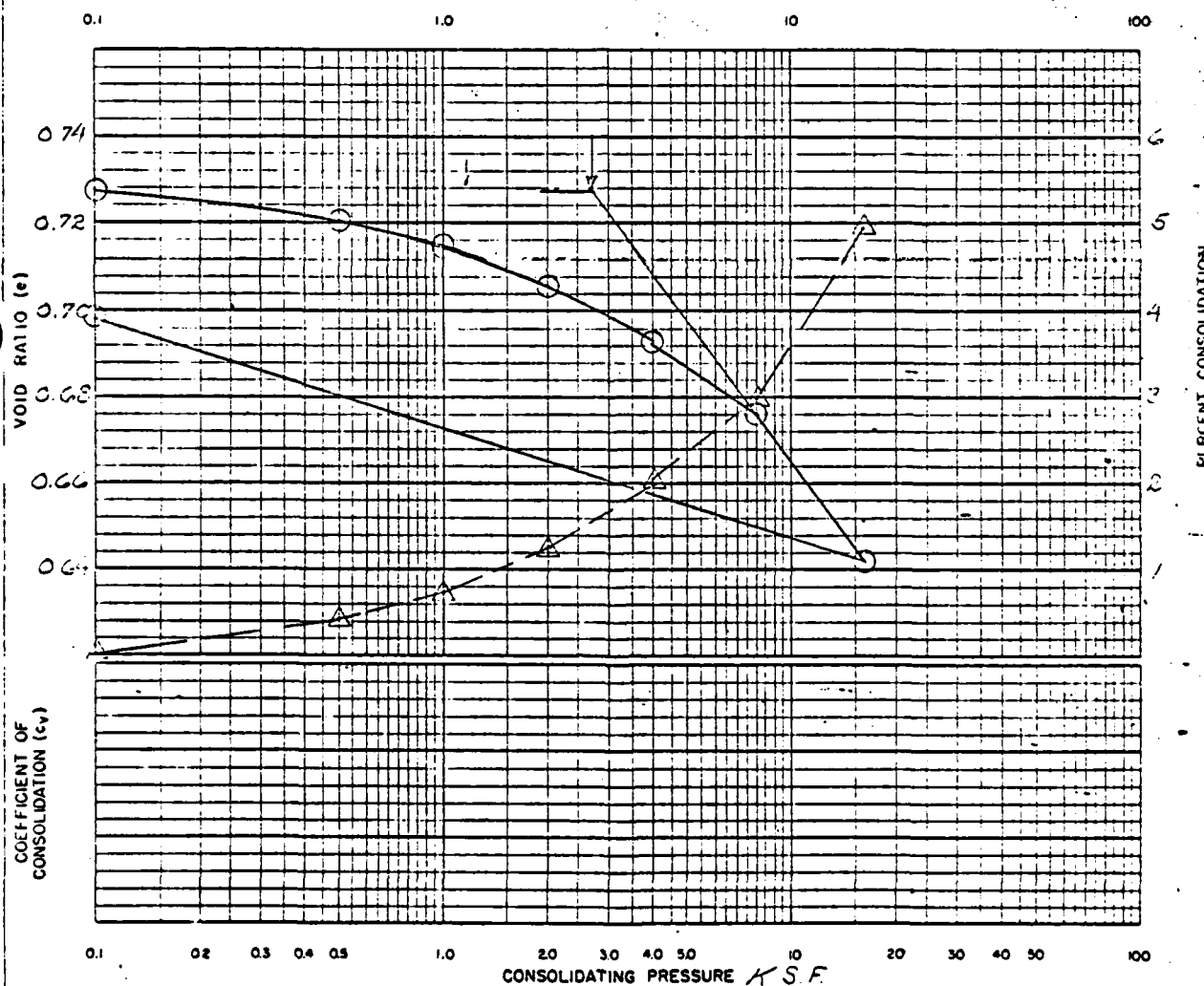
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MATERIALS TESTING REPORT **U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE** **CONSOLIDATION TEST**

PROJECT and STATE <u>LITTLE CHOCOMUT NO. 2A NEW YORK</u>		SAMPLE LOCATION <u>S. DAK.</u>	
FIELD SAMPLE NO. <u>2A-1-1-1</u>	DEPTH <u>12.5-12.5</u>	GEOLOGIC ORIGIN <u>Locustrine</u>	
TYPE OF SAMPLE <u>undisturbed</u>	TESTED AT <u>Lab.</u>	APPROVED BY <u>LPD</u>	DATE <u>4-18-66</u>

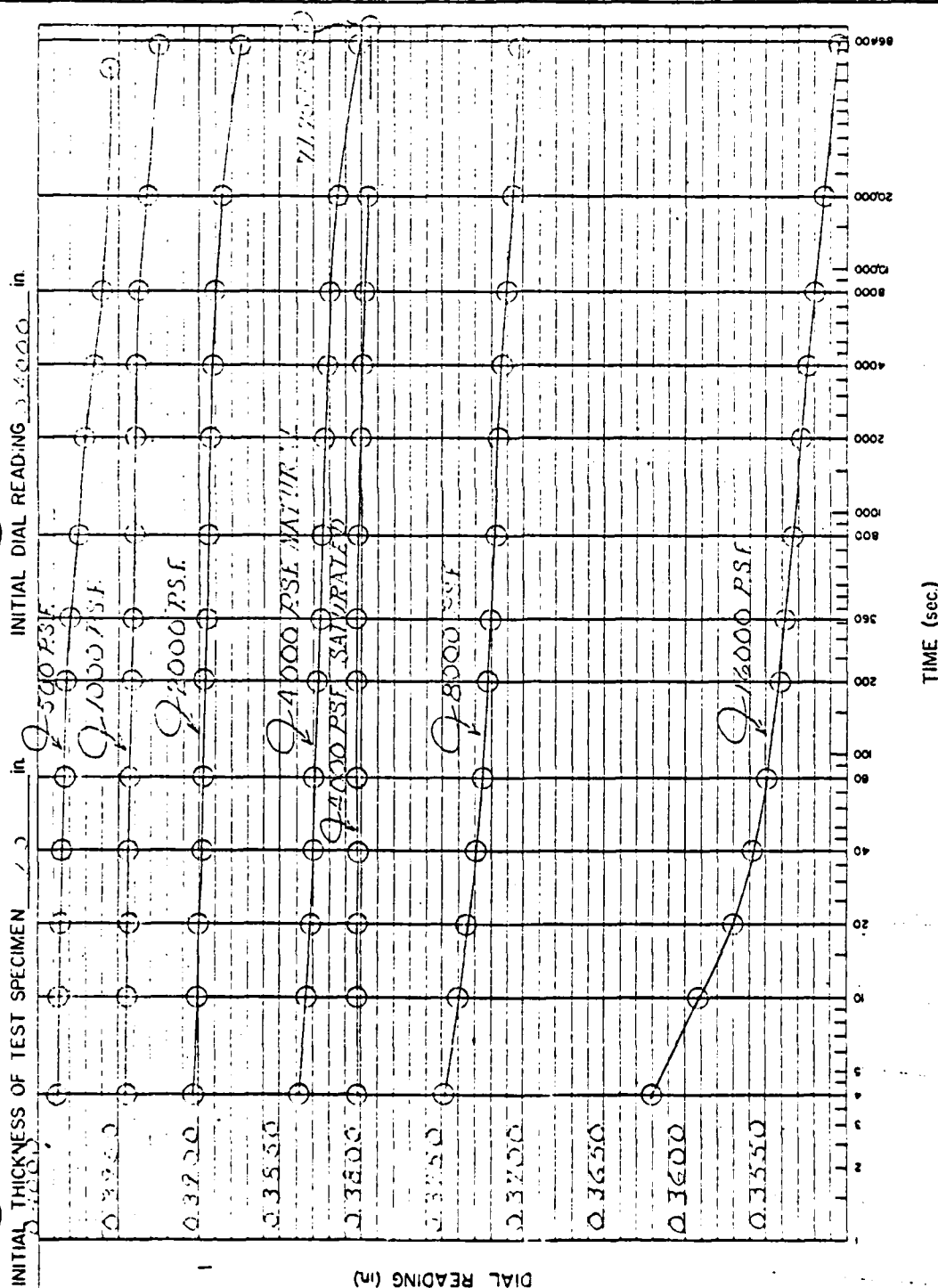
CLASSIFICATION CL
 G_s 2.75 LL 31 PI 15
 INITIAL DENSITY γ_d 1.45
 INITIAL VOID RATIO, e_0 0.7272
 COMPRESSION INDEX, C_c _____

TEST SPECIFICATIONS:
Saturated at 4000 PSF



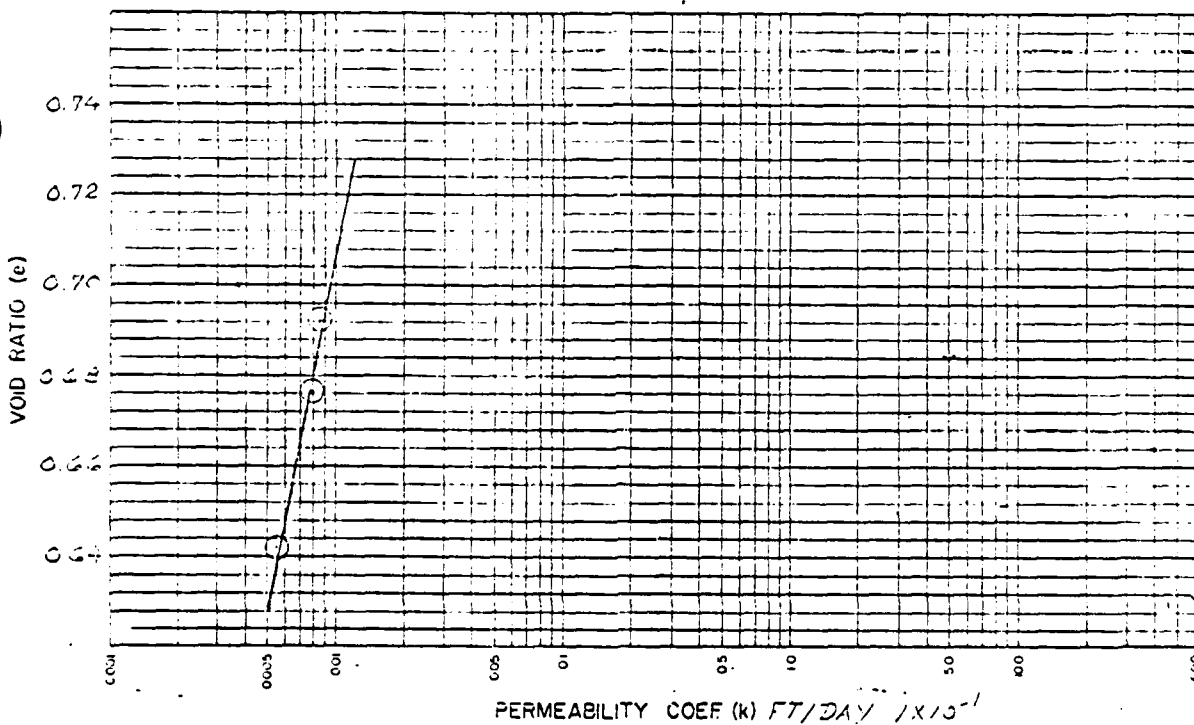
REMARKS

MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		LOG TIME CONSOLIDATION	
PROJECT and STATE				SAMPLE LOCATION	
FIELD SAMPLE NO.	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE	TESTED AT	APPROVED BY		DATE	
		LPD		4-18-66	



REMARKS

MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT AND STATE				SAMPLE LOCATION	
FIELD SAMPLE NO.				DEPTH	
TYPE OF SAMPLE				TESTED AT	
CLASSIFICATION CL				APPROVED BY	
TEST NO.				DATE	
INITIAL MOISTURE %				SPECIFIC GRAVITY	
DRY DENSITY $\frac{g}{cc}$				G _s (-)*4	
VOID RATIO				G _s (+)*4	
PERMEABILITY COEF				G _m (Bulk)(+)*4	
PERCOLATION COEF				TEST SPECIFICATIONS	
H _L DURING TEST				Falling Head Permeability Test on the Consolidation Sample	



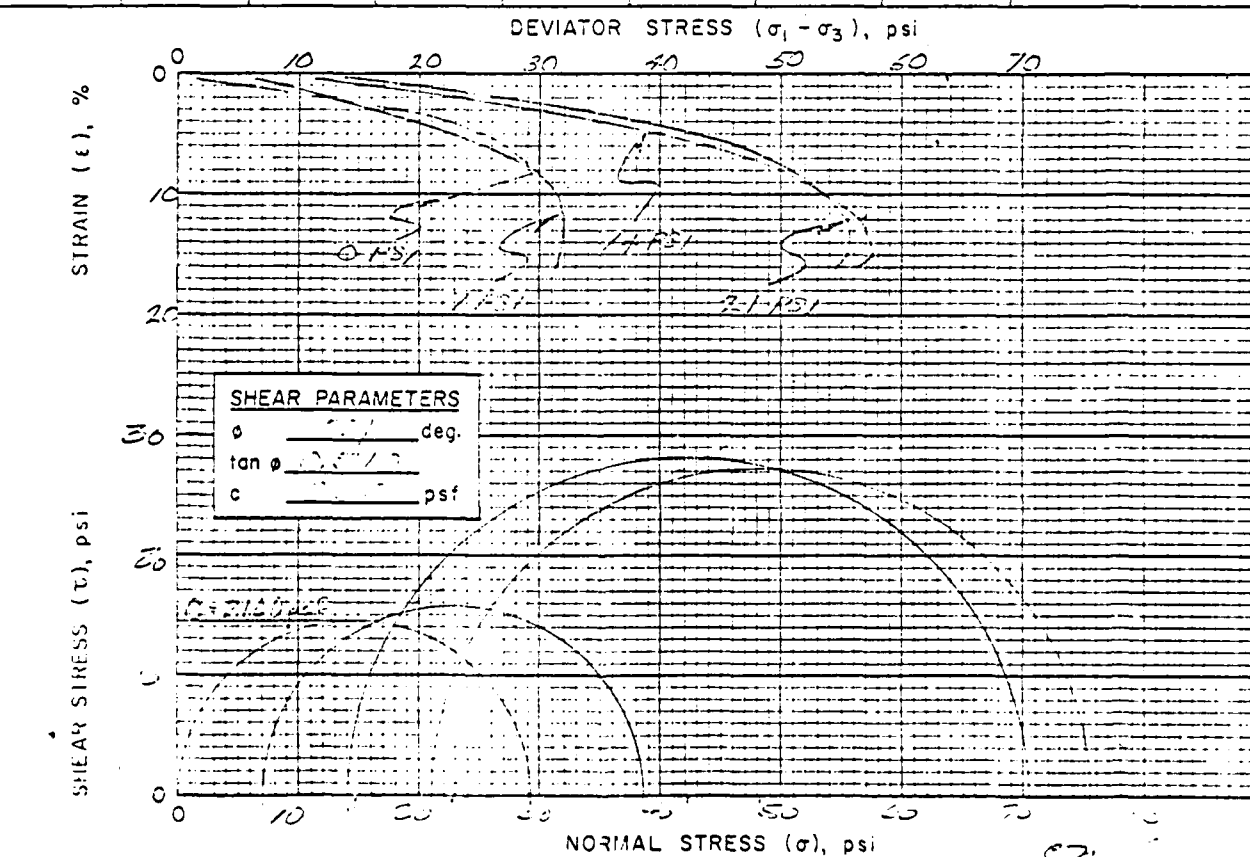
REMARKS

MATERIALS TESTING REPORT **U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE** **TRIAxIAL SHEAR TEST**

PROJECT AND STATE <u>1. 100' DAM</u>		SAMPLE LOCATION <u>2. DAM</u>	
FIELD SAMPLE NO. <u>165-12.5</u>	DEPTH <u>165-12.5</u>	GEOLOGIC ORIGIN	
TYPE OF SAMPLE <u>1. 100' DAM</u>	TESTED AT <u>165-12.5</u>	APPROVED BY <u>LPO</u>	DATE <u>4-18-66</u>

INDEX TEST DATA		SPECIMEN DATA		TYPE OF TEST
USCS <u>CL</u>	LL <u>31</u> ; PI <u>10</u>	HEIGHT <u>3.0</u> "	DIAMETER <u>1.2</u> "	UU <input type="checkbox"/> CU <input checked="" type="checkbox"/> SU <input type="checkbox"/> CD <input type="checkbox"/>
% FINER (mm): 0.002 <u>11</u> ; 0.005 <u>55</u> ; 0.074 (# 200) <u>110</u>		MATERIALS TESTED PASSED <u>#4</u> SIEVE		
G _s (+4) <u>2.73</u> ; G _s (+#4)		METHOD OF PREPARATION <u>Trimmed</u>		
STANDARD: Y _d MAX. _____ pcf ; w ₀ _____ %		From a Core Sample		
MODIFIED: Y _d MAX. _____ pcf ; w ₀ _____ %		MOLDING MOISTURE _____ %		
		MOLDED AT _____ % OF Y _d MAXIMUM		

DRY DENSITY		MOISTURE CONTENT, %			TIME OF CONSOLIDATION (hrs.)	MINOR PRINCIPAL STRESS σ_3 (psi)	DEVIATOR STRESS $\sigma_1 - \sigma_3$ (psi)	AXIAL STRAIN AT FAILURE, ϵ (%)
INITIAL pcf <input type="checkbox"/> g/cc <input type="checkbox"/>	CONSOLIDATED pcf <input type="checkbox"/> g/cc <input type="checkbox"/>	START OF TEST	DEG. OF SAT. AT START OF TEST	END OF TEST				
<u>1.60</u>		<u>26.4</u>	<u>100.0</u>			<u>0</u>	<u>29.4</u>	<u>50</u>
<u>1.58</u>	<u>1.58</u>	<u>27.5</u>	<u>100.0</u>	<u>27.4</u>	<u>6.18</u>	<u>7</u>	<u>29.4</u>	<u>50</u>
<u>1.61</u>	<u>1.61</u>	<u>27.2</u>	<u>100.0</u>	<u>27.1</u>	<u>6.33</u>	<u>14</u>	<u>29.4</u>	<u>50</u>
<u>1.58</u>	<u>1.58</u>	<u>27.6</u>	<u>100.0</u>	<u>27.6</u>	<u>6.43</u>	<u>21</u>	<u>29.4</u>	<u>50</u>



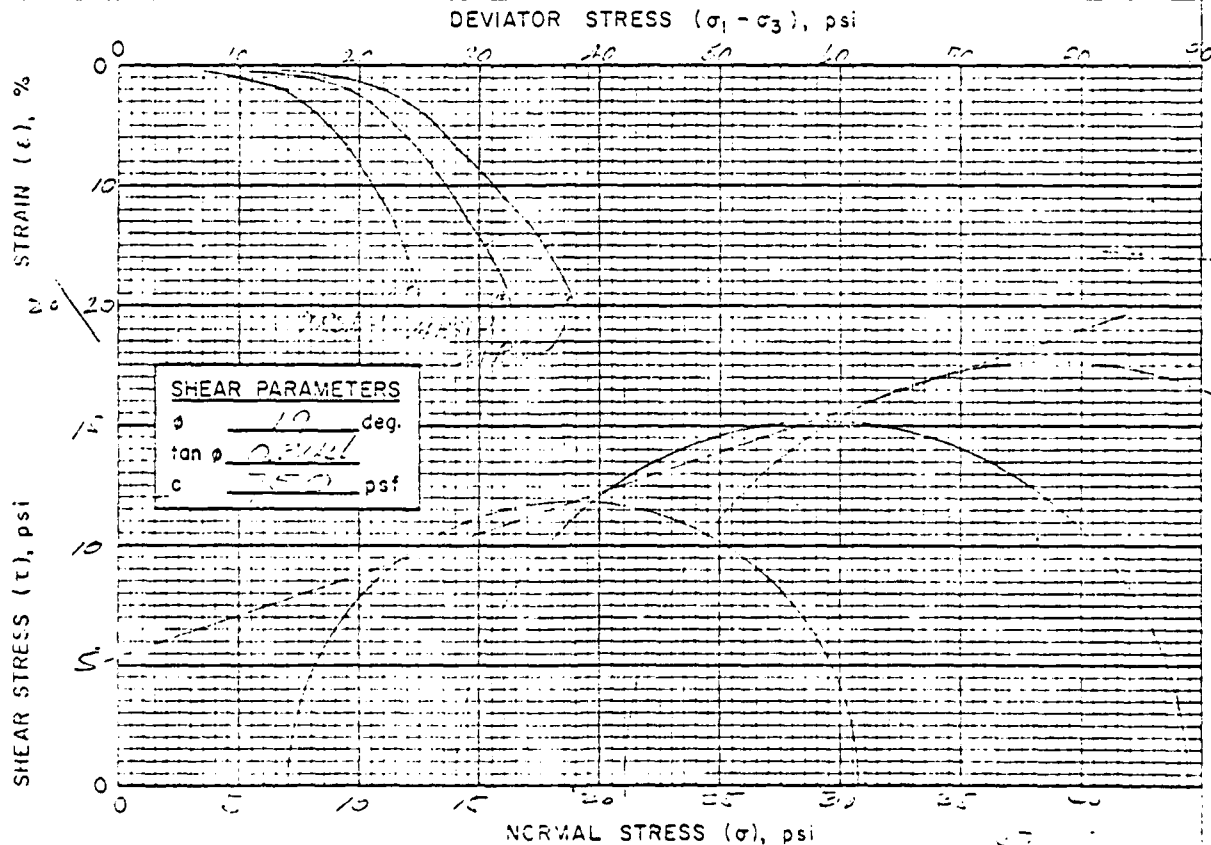
REMARKS

MATERIALS TESTING REPORT **U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE** **TRIAxIAL SHEAR TEST**

PROJECT AND STATE <u>1-1000 Highway Site 1-2 15-100K</u>		SAMPLE LOCATION <u>FIELD ROAD</u>	
FIELD SAMPLE NO <u>2021</u>	DEPTH <u>20-00</u>	GEOLOGIC ORIGIN <u>CLAY</u>	
TYPE OF SAMPLE <u>UNDISTURBED</u>	TESTED AT <u>10-10-66</u>	APPROVED BY <u>LOD</u>	DATE <u>4-19-66</u>

INDEX TEST DATA		SPECIMEN DATA		TYPE OF TEST
USCS <u>CL</u>	LL <u>25</u> ; P <u>17</u>	HEIGHT <u>3.0</u> " ; DIAMETER <u>1.4</u> "		
% FINER (mm): 0.002 <u>12</u> ; 0.005 <u>17</u>	0.075 (#200) <u>42</u>	MATERIALS TESTED PASSED <u>1/2</u> SIEVE		UU <input type="checkbox"/>
G _s (#4) <u>2.71</u> ; G _s (#4) <u>2.77</u>		METHOD OF PREPARATION <u>STATIC</u>		CU <input checked="" type="checkbox"/>
STANDARD: γ_d MAX. <u>121.5</u> pcf ; w_0 <u>15.0</u> %		MOLDING MOISTURE <u>14.6</u> %		CU <input type="checkbox"/>
MODIFIED: γ_c MAX. _____ pcf ; w_0 _____ %		MOLDED AT <u>95.4</u> % OF γ_c MAXIMUM		CU <input type="checkbox"/>

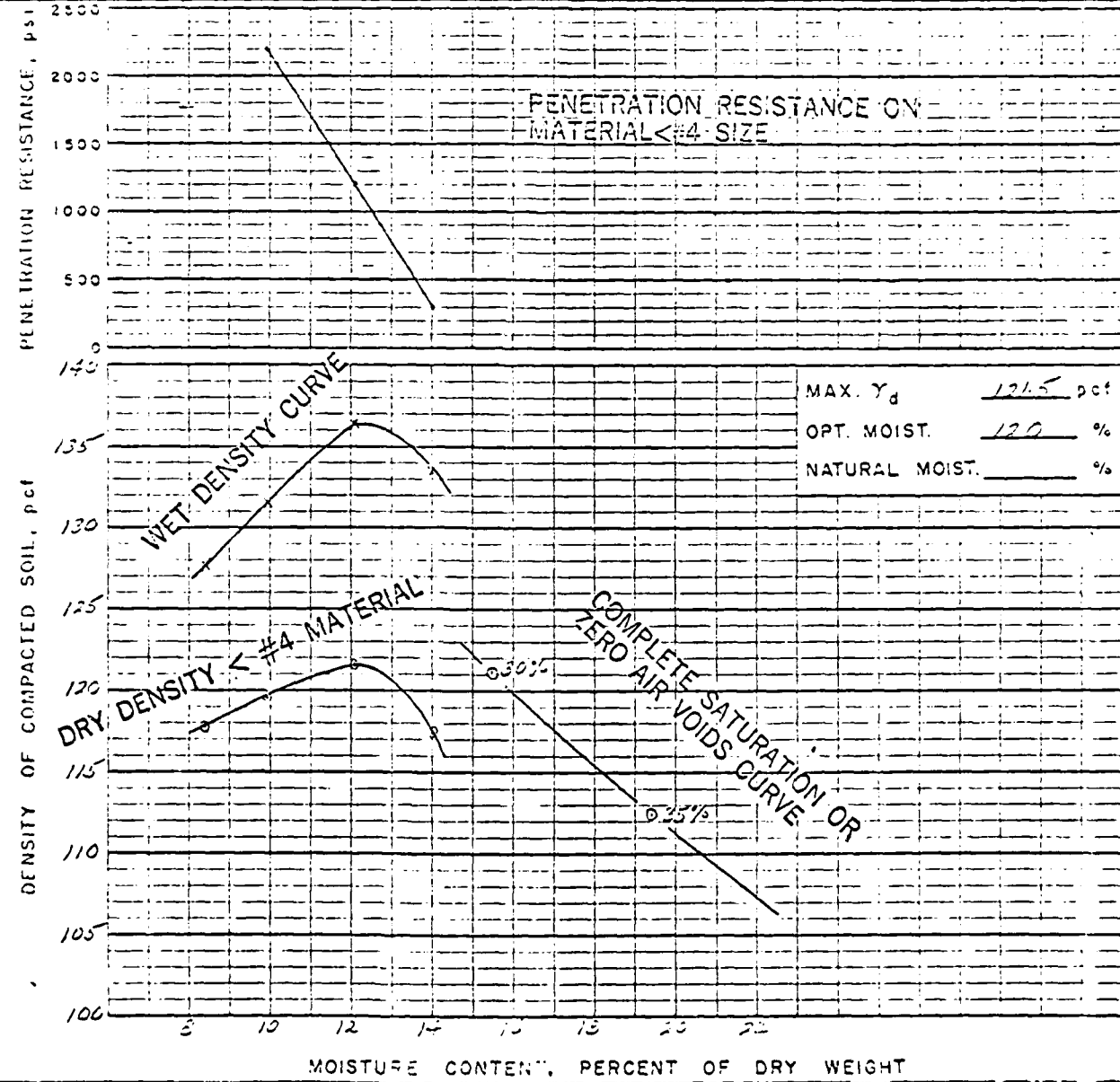
DRY DENSITY		MOISTURE CONTENT, %			TIME OF CONSOLIDATION (hrs.)	MINOR PRINCIPAL STRESS σ_3 (psi)	DEVIATOR STRESS $\sigma_1 - \sigma_3$ (psi)	AXIAL STRAIN AT FAILURE, ϵ (%)
INITIAL pcf <input checked="" type="checkbox"/> g/cc <input type="checkbox"/>	CONSOLIDATED pcf <input checked="" type="checkbox"/> g/cc <input type="checkbox"/>	START OF TEST	DEG. OF SAT. AT START OF TEST	END OF TEST				
116.1	116.7	15.4	92.7	16.1	15.97	7	32.7	15
116.1	116.0	16.6	93.2	15.2	16.07	14	30.2	15
115.5	115.6	17.1	95.5	15.6	15.97	21	25.2	15



REMARKS TESTED @ 95.4% STD

MATERIALS U.S. DEPARTMENT OF AGRICULTURE
TESTING REPORT SOIL CONSERVATION SERVICE COMPACTION AND
PENETRATION RESISTANCE

PROJECT: <u>1116</u>			
FIELD SAMPLE NO. <u>2121</u>	LOCATION <u>Forest</u>	DEPTH <u>2'-12'</u>	
DESIGNATION <u>Glacial Till</u>	TESTED BY <u>LPD</u>	DATE <u>4-18-66</u>	
CLASSIFICATION <u>CL</u>	LL <u>24</u> PI <u>0</u>	CURVE NO. <u>1</u> OF <u>3</u>	
MAX. PARTICLE SIZE INCLUDED IN TEST <u>2.0</u> "		STD (ASTM D-698) <input checked="" type="checkbox"/> METHOD <u>2.0</u>	
SPECIFIC GRAVITY (G _s) { MINUS NO. 4 <u> </u> PLUS NO. 4 <u> </u>		MOD (ASTM D-1557) <input type="checkbox"/> METHOD <u> </u>	
		OTHER TEST <input type="checkbox"/> (SEE REMARKS)	



REMARKS

LABORATORY NO. CL-123-15MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICECOMPACTION AND
PENETRATION RESISTANCE

FIELD SAMPLE NO.

1921

LOCATION

Flower

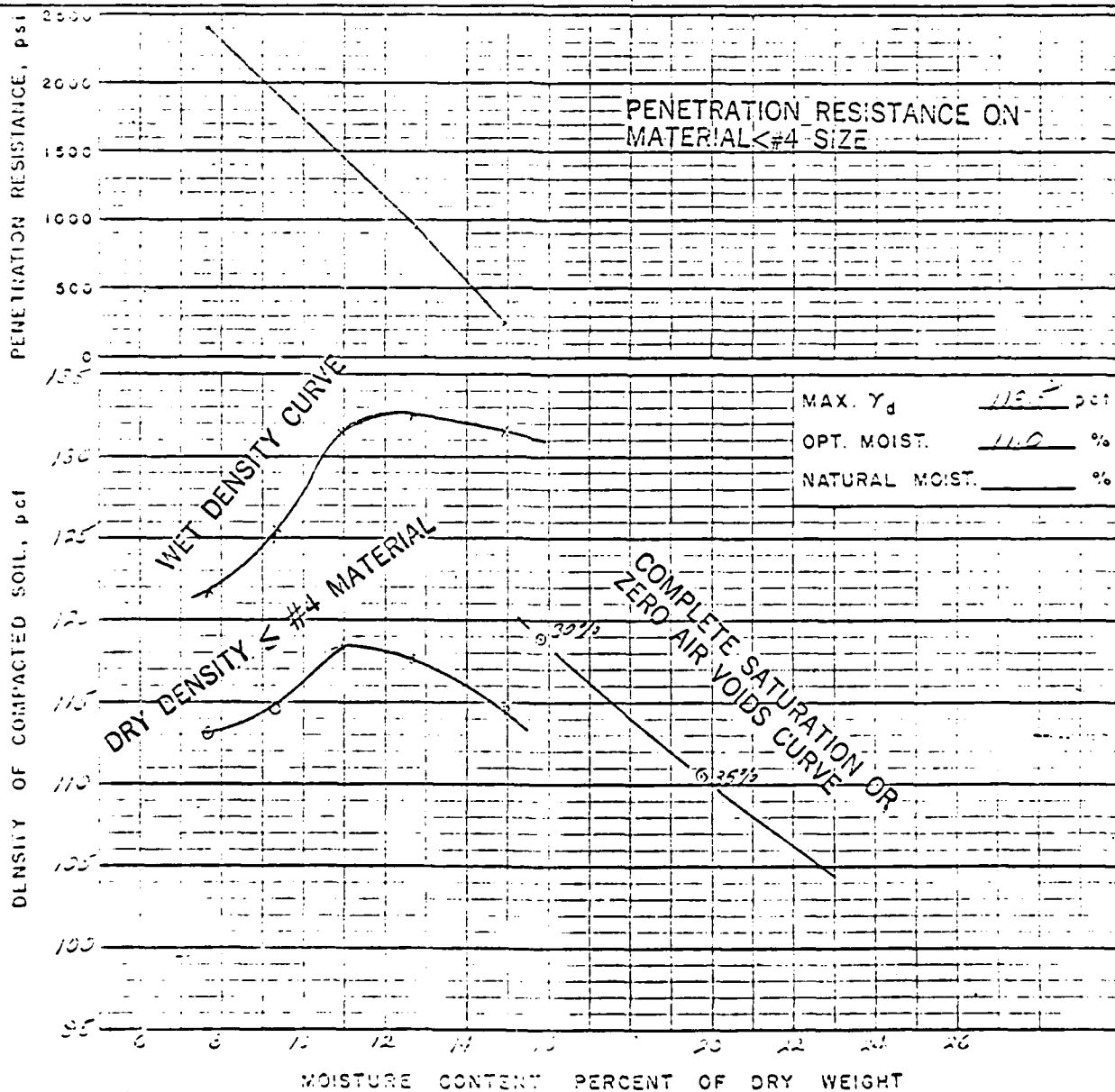
DEPTH

2'-9"

TESTED AT

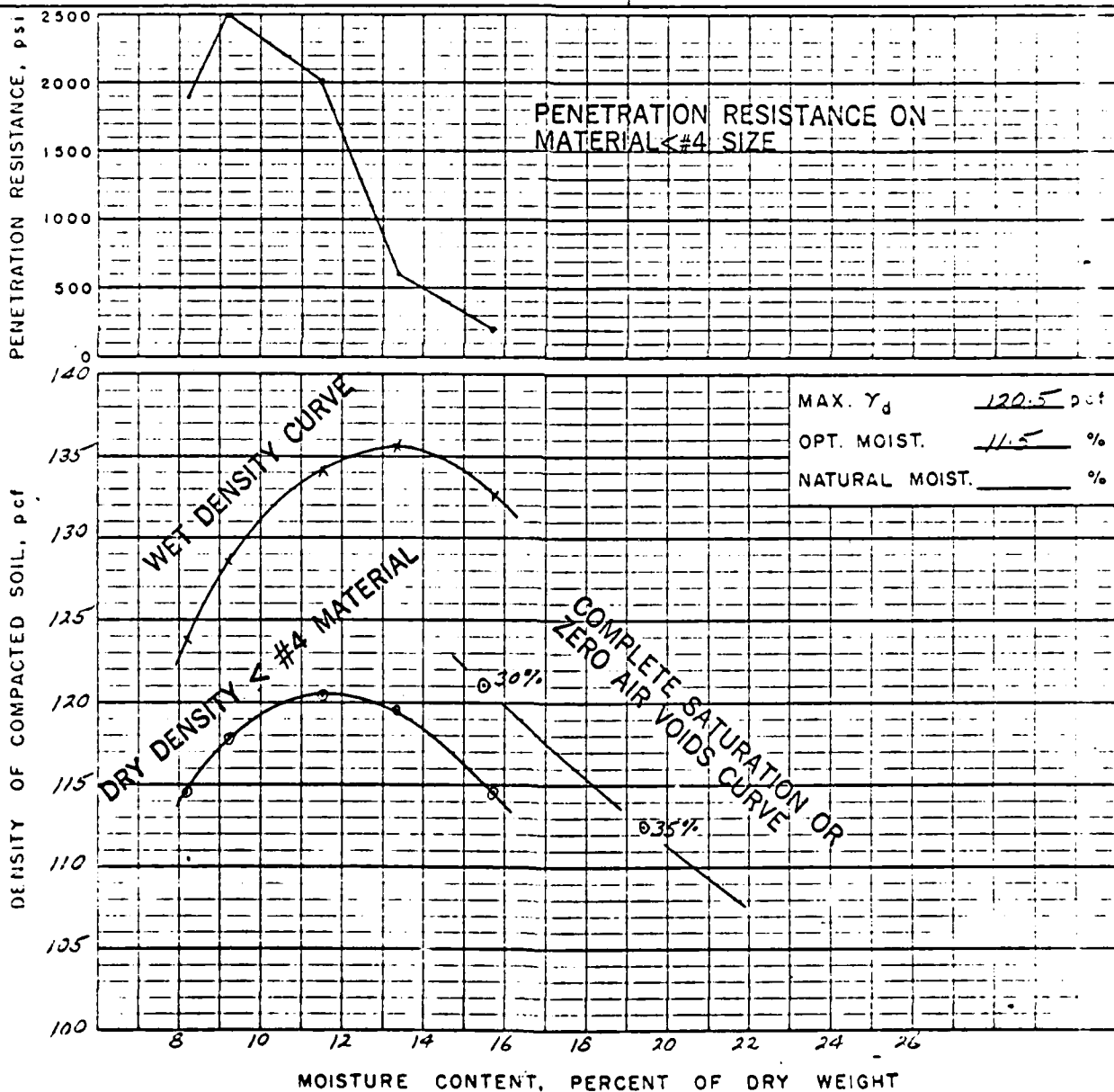
APPROVED BY

DATE

Clayey TillL.P.D.4-18-66CLASSIFICATION GC-GMLL 45 PI 10CURVE NO. 2 OF 2MAX. PARTICLE SIZE INCLUDED IN TEST 2" MAXSTD (ASTM D-698) ☐ METHOD 2SPECIFIC GRAVITY (G_s) { MINUS NO. 4 2.72MOD. (ASTM D-1557) ☐ METHOD { PLUS NO. 4 0.075OTHER TEST ☐ (SEE REMARKS)

REMARKS

MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		COMPACTION AND PENETRATION RESISTANCE	
PROJECT AND STATE <u>Little Chaconut # 2-A, New York</u>					
FIELD SAMPLE NO. <u>104.1</u>		LOCATION <u>Barrow</u>		DEPTH <u>2'-5.5'</u>	
SOURCE ORIGIN <u>Glacial Till</u>		TESTED AT <u>M.L. Lincoln</u>		APPROVED BY <u>L.P.D.</u>	
DATE <u>4-18-66</u>					
CLASSIFICATION <u>GC</u> LL <u>29</u> PI <u>8</u>		CURVE NO. <u>3</u> OF <u>2</u>			
MAX. PARTICLE SIZE INCLUDED IN TEST <u>< #4</u>		STD. (ASTM D-698) <input checked="" type="checkbox"/> METHOD <u>1</u>			
SPECIFIC GRAVITY (G_s) { MINUS NO. 4 <u>2.72</u>		MOD. (ASTM D-1557) <input type="checkbox"/> METHOD <u> </u>			
PLUS NO. 4 <u>2.70</u>		OTHER TEST <input type="checkbox"/> (SEE REMARKS)			



REMARKS

MATERIALS TESTING REPORT	U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE	UNDISTURBED SAMPLE CHARACTERISTICS
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PROJECT and STATE Little Choconut Site No 2A New York

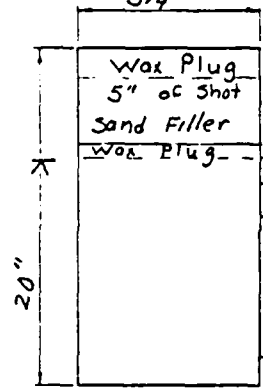
TESTED AT SME - Lincoln APPROVED BY LPD DATE 3-7-66

FIELD SAMPLE NO	DEPTH (ft) from to	SAMPLE LOCATION	TYPE OF SAMPLE	LABORATORY NO
DH51-A-1	16.5' 18.5'	E Dam	Shelby	66W2345

COLOR	RELATIVE MOISTURE	CONSISTENCY	POROSITY OR STRUCTURE	TEXTURE	POCKET PENETROMETER (TSF)	VISUAL CLASSIFICATION (USCS)
Lt. Gray	Wet	Firm		Silty	2.75	ML

w 25.6 % γ_s 1.61 g/cc
27.2 1.56 g/cc
3 1/4"

REMARKS - Suggest expanding packers rather than Wax for sealing.



Top 2" disturbed
rd & MA on this Section
Saved 15" of Good
Core from this Section
rd & MA on this Section

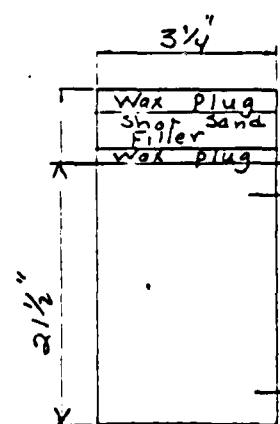
There is a few
dark gray Varves
in the sample saved

FIELD SAMPLE NO	DEPTH (ft) from to	SAMPLE LOCATION	TYPE OF SAMPLE	LABORATORY NO
DH51-A-2	26.5' 28.5'	E Dam	Shelby	66W2346

COLOR	RELATIVE MOISTURE	CONSISTENCY	POROSITY OR STRUCTURE	TEXTURE	POCKET PENETROMETER (TSF)	VISUAL CLASSIFICATION (USCS)
Lt. Gray	Sat.	Firm	Varves of Various Thickness	Silty	2.75 1.25	ML

w _____ % γ_s _____ g/cc

REMARKS Suggest expanding packers rather than Wax for sealing.



rd & MA on this Section
Saved 17" of
Good Core from
This Section
rd & MA on this Section
D-37

Varved Sediments - some
Varves are more plastic
than others - The core
saved is cracked
approximately 6" from
The top at one of
The Varves. The Sample
has a Tendency to
separate at the bottom

PREVIOUS INSPECTION REPORTS

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DAM INSPECTION REPORT
(By Visual Inspection)

Dam Number	River Basin	Town	County	Hazard Class*	Date & Inspector
96A-3628	SUSP.	Union	Broome	A-B	5/28/76 KD/H

Type of Construction	Use
<input type="checkbox"/> Earth w/concrete spillway	<input type="checkbox"/> Water Supply
<input checked="" type="checkbox"/> Earth w/drop inlet pipe	<input checked="" type="checkbox"/> Power Flood Control
<input type="checkbox"/> Earth w/stone or riprap spillway	<input type="checkbox"/> Recreation
<input type="checkbox"/> Concrete	<input type="checkbox"/> Fish and Wildlife
<input type="checkbox"/> Stone	<input type="checkbox"/> Farm Pond
<input type="checkbox"/> Timber	<input type="checkbox"/> No Apparent Use-Abandoned

Estimated Impoundment Size	Estimated Height of Dam above Streambed
<input type="checkbox"/> 1-5 acres	<input type="checkbox"/> Under 10 feet
<input type="checkbox"/> 5-10 acres	<input type="checkbox"/> 10-25 feet
<input checked="" type="checkbox"/> Over 10 acres 24. Mu X.	<input checked="" type="checkbox"/> Over 25 feet 27

Condition of Spillway	
<input checked="" type="checkbox"/> Service satisfactory	<input checked="" type="checkbox"/> Auxiliary satisfactory
<input type="checkbox"/> In need of repair or maintenance	<input type="checkbox"/> In need of repair or maintenance

Explain: _____

Condition of Non-Overflow Section	
<input checked="" type="checkbox"/> Satisfactory	
<input type="checkbox"/> In need of repair or maintenance	Explain: _____

Condition of Mechanical Equipment	
<input checked="" type="checkbox"/> Satisfactory	
<input type="checkbox"/> In need of repair or maintenance	Explain: _____

Evaluation (From Visual Inspection)

- ☒ No defects observed beyond normal maintenance
☐ Repairs required beyond normal maintenance

*Explain Hazard Class, if Necessary _____

WATERSHED Little Chocoma

SLIP NO.

DATE OF INSPECTION 6/9/80

DATE OF LAST INSP.

SPONSOR WITH OPERATIONS AND MAINTENANCE RESPONSIBILITY

147/528

SPONSOR WITH OPERATIONS AND MAINTENANCE RESPONSIBILITY
DES/EN
Brent County Soil and Water Conservation District
(present)

PRESENT HAZARD CLASSIFICATION

NEW CLASSIFICATION IF WARRANTED

PAGE 2

O & M ITEMS

SATISFACTORY/UNSATISFACTORY - EXPLANATION

5. RESERVOIR AREA	
a.) Undesirable Vegetation	<u>UNSATISFACTORY</u> (a.) CAFFAILS IN BGM, INTERFERE WITH DRIFTE AREA OF RISER.
b.) Cut or Fallen Trees	<u>SATISFACTORY</u> (b.) NONE PRESENT
c.) Debris/Slash	<u>SATISFACTORY</u> (c.) POWER WAS MOVED RIGHT TRASH BACK/RIGHT MUDGY BONES
d.) Sedimentation	<u>SATISFACTORY</u> (d.) REMOVED CAFFAILS ON BGM FROM PUL AREA
6. OUTLET CHANNEL	
a.) Sedimentation	<u>SATISFACTORY</u> (a.) NONE
b.) Cutting and Scouring	<u>SATISFACTORY</u> (b.) NONE
c.) Woody Growth	<u>SATISFACTORY</u> (c.) GRASS SHOULD BE MOVED AND REMOVED
7. ROCK RIPRAP	
a.) Undermining	<u>SATISFACTORY</u> (a.) NONE
b.) Adjacent Channel Scouring	<u>SATISFACTORY</u> (b.) NONE
c.) Deterioration	<u>SATISFACTORY</u> (c.) NO DETRIORATION.
8. TRASH RACKS, GRATINGS	
a.) Accumulated Debris	<u>SATISFACTORY</u> (a.) RAINY LOGS WERE REMOVED
b.) Broken or Missing Parts	<u>SATISFACTORY</u> (b.) NONE
c.) Galvanizing or Paint	<u>SATISFACTORY</u> (c.) NOT NEEDED
9. OTHER SPECIAL STRUCTURES	
a.) Diversions	<u>N/A</u> (a.)
b.) Access Roads	<u>SATISFACTORY</u> (b.)
c.) Waterways	<u>N/A</u> (c.)
d.) Other, list.....	<u>N/A</u> (d.)
e.) Other, list.....	<u>N/A</u> (e.)
10. PRINCIPLE SPILLWAY	
a.) Riser	<u>SATISFACTORY</u> (1.) NO SPRINGS OR SWAMPING PRESENT
1.) Condition of Concrete	<u>SATISFACTORY</u> (2.) NONE OF SIGNIFICANT NATURE
2.) Seepage and Cracks	<u>N/A</u> (3.)
3.) Condition of Transition	

12. PUMP SYSTEMS

General condition report, continued:-----

N/A

13. SAFETY

List all hazards present: (including broken guards, rails, rope swings, diving boards on risers, evidence of pollution, garbage) ADULT PRESENT. DIVE IN 6000 SAFETY - SAFE!

RECOMMENDED REPAIRS AND METHOD OF REPAIR: Replace broken fence ties and fence. Repair controls from
Chlor. system. Every summer. Keep back. Prevent things from getting in. Inlet is covered. A new gate is
highly recommended.

INSPECTED BY

Yong J. Lee

TITLE

Project Engineer

DUTY STATION

Brighton Waterworks Office

NOTE: DESIGNATE NOT APPLICABLE ITEMS BY MARKING N/A.

OPERATIONS & MAINTENANCE 1980 REPORT
BROOME COUNTY SOIL & WATER CONSERVATION DISTRICT

PL-566 Sites

1. Little Choconut #1
 - Mowed dike and emergency spillway
 - Removed debris from riser and pool area
 - Operated gate
2. Little Choconut #1A
 - Mowed dike and emergency spillway
 - Operated gate
 - Removed debris from riser and pool area
3. Little Choconut #2
 - Replaced stone-lined waterway - installed 482 tons
 - Removed sediment from pool - 150 c.y.
 - Mowed dike and emergency spillway
 - Debris removed from riser and pool area
 - Operated gate
4. Little Choconut #2A
 - Repaired barbed wire fence
 - Mowed dike and emergency spillway
 - Operated gate
 - Removed debris from riser and pool area
 - Replaced gate
5. Little Choconut #2B
 - Mowed dike and spillway
 - Operated gate
 - Removed debris from riser and pool area
6. Little Choconut #2C
 - Mowed dike and spillway
 - Operated gate
 - Repaired fence
 - Installed gate on access road
 - Removed debris from riser and pool area
7. Little Choconut #2E
 - Mowed dike and emergency spillway
 - Operated gate
 - Removed debris from riser and pool area
8. Little Choconut #3C
 - Mowed dike and spillway
 - Operated gate
 - Repaired gate
 - Attempted to unplug 6" drain into riser, will require pumping dry and dredging to uncap pool end

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

R.D. # 1, County Airport Road, Johnson City, New York 13790

SUBJECT ENG-210, Engineering O&M Inspections

DATE: June 20, 1980

TO

Mr. Richard G. Perritt, DC
Soil Conservation Service
Farm, Home, & 4H Center
840 Front Street
Binghamton, New York 13905

Engineering Operations and Maintenance Inspections have been completed by this office on Little Choconut Site 2A and Nanticoke Site 9E. Enclosed please find copies of reports necessary for distribution to the sponsor, area conservationist, state office, and NYSDEC. In summary, the inspections turned out as follows:

LITTLE CHOCONUT SITE 2A

The site is in excellent condition overall. Minor maintenance is needed as listed below:

1. Mowing of the emergency spillway bottom.
2. Some barbed wire fence and associated ties need replacing with new materials. Please consult the AS-BUILT drawings for required types of materials.
3. A new gate is recommended for this site. The present gate is quite flimsy and could easily be vandalized.
4. Cattails along berm of the dam should be removed, along with some tree branched and logs located near the riser. Two hockey goals are situated within the flood pool area and should be removed due to potential of plugging the riser during high water conditions.
5. Grass should be removed from the outlet channel. Capacity seems to be greatly reduced due to this grass, and potential for high tailwater is present.

NANTICOKE CREEK SITE 9E

The site is in average condition. The following items need attention:

1. Mowing of spillways is needed.
2. Downstream slope of structure should be checked for ph level. If necessary, lime should be applied (moss is present beneath the crownvetch).
3. New barbed wire and ties is needed along the downstream toe of the structure. Consult the AS-BUILT drawings for required types of materials.
4. The entrance gate should be adjusted or replaced so as to allow for smooth operation. This gate should be locked at all times.
5. A major amount of debris (logs and branched) needs to be removed from



the reservoir area, riser area, and emergency spillway inlets. It will be necessary to go around the permanent pool to pick up some of the debris.

6. Top dressing and seeding, mulching of the downstream right hand crease is needed. Erosion is accelerated in this area.

7. Small willow trees need to be removed from the outlet channel.

8. Four (4) angles on the high stage trash rack (riser) need to be removed and replaced. These angles are bent to a great degree, and may jeopardize the structure during high water.

9. A trash rack is recommended for the impact basin. This is necessary for safety purposes.

Some spalling and pitting of the principle spillway pipe is noted. I do not recommend any repairs at this time. However, the pipe should be monitored for future deterioration. The riser bottom is also exhibiting pitting. The application of an epoxy such as Meta-Cote 363GP manufactured by American Metaseal Co. of Carlstadt, New Jersey should be made in the next year to ensure protection of steel reinforcement in the structure.

We will be continuing our inspections on other sites in the county during the remainder of the summer. If you have any questions concerning the repairs, please feel free to contact me.



Gary L. Page, Project Engineer
Binghamton Watershed Office

cc. Herbert J. Lyford, AC, SCS, Binghamton NY
Phillip J. Nelson, SCE, SCS, Syracuse NY
Bill Maxian, Broome County Soil and Water Cons. District

APPENDIX E

REFERENCES

REFERENCES

1. Chow, Ven Te, Editor - Handbook of Applied Hydrology. McGraw-Hill Book Company, New York, N.Y., 1964.
2. Hydrologic Engineering Center, U.S. Army Corps of Engineers, "HEC-1 Flood Hydrograph Package, Users Manual". Davis, Cal., January 1973.
3. Hydrologic Engineering Center, U.S. Army Corps of Engineers, "Flood Hydrograph Package (HEC-1), Users Manual for Dam Safety Investigations", Davis, Cal., September 1978.
4. King, Horace, and Brater, Ernest. Handbook of Hydraulics, 5th Edition. McGraw-Hill Book Company, New York, N.Y., 1963.
5. U.S. Department of the Interior. Design of Small Dams, 2nd Edition, Washington, D.C., 1973.

APPENDIX F

DRAWINGS

FINCH HOLLOW, LITTLE CHOCONUT & TR WATERSHED PROJECT

FLOODWATER RETARDING DAM NO. 2-A

DRAINAGE AREA	406 ACRES
TOTAL STORAGE (TO EMERGENCY SPILLWAY CREST)	175 ACRE FT.
WATER SURFACE AREA (SEDIMENT POOL)	4 ACRES
HEIGHT OF DAM	27 FEET
VOLUME OF FILL	50,000 CUBIC YARD 31,551

BUILT UNDER THE WATERSHED PROTECTION AND
FLOOD PREVENTION ACT

BY

COUNTY OF BROOME

WITH THE ASSISTANCE OF THE
SOIL CONSERVATION SERVICE

OF THE

U S DEPARTMENT OF AGRICULTURE

INDEX

SHEET 1 - COVER SHEET
SHEET 2 - PLAN OF STORAGE AREA
SHEET 3 - PLAN OF STRUCTURAL WORKS
SHEET 4 - PROFILES
SHEET 5 - FILL PLACEMENT & PRINCIPAL SPILLWAY EXCAVATION
SHEET 6 - DRAINAGE SYSTEM DETAILS
SHEET 7 - PROFILE OF PRINCIPAL SPILLWAY
SHEET 8 - PROFILE OF PRINCIPAL SPILLWAY
SHEET 9 - REEFER STRUCTURAL DETAILS
SHEET 10 - TRASH RACK, VENTING TUBE & ANIMAL GUARD
SHEET 11 - COLLAR, BEDDING & MISC. DETAILS
SHEET 12 - POND DRAIN INLET DETAILS
SHEET 13 - FENCING DETAILS
SHEET 14 - LOGS OF TEST HOLES

NUT & TROUT BROOK PROJECT AS BUILT

DAM NO. 2-A

406 ACRES

175 ACRE FT.

4 ACRES

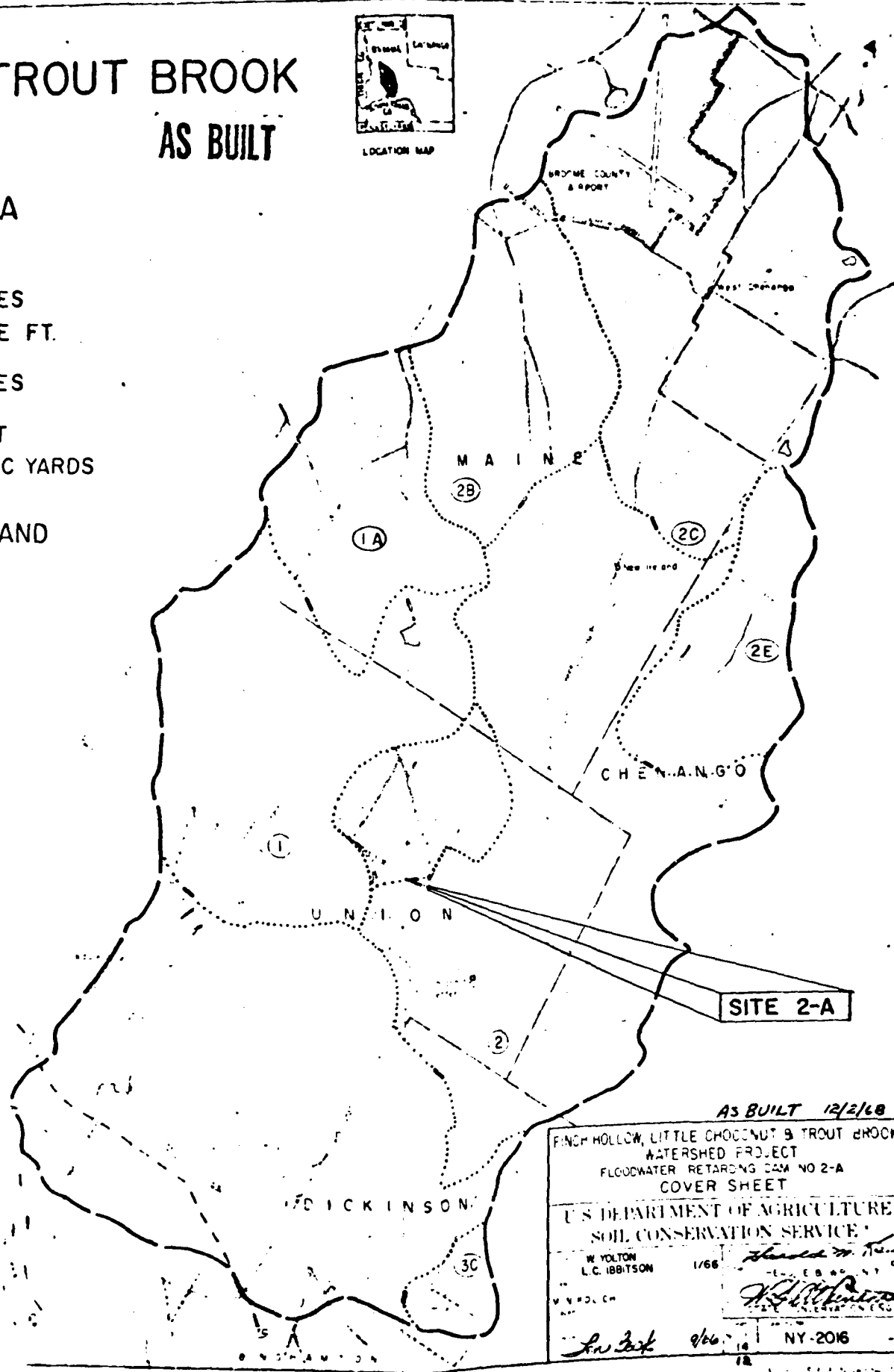
27 FEET

~~30,000~~ CUBIC YARDS
31,551

PROTECTION AND
ACT

OF THE
SERVICE

ICULTURE



AS BUILT 12/2/68

FINCH HOLLOW, LITTLE CHOCUNUT & TROUT BROOK
WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 2-A
COVER SHEET

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

W. YOLTON
L.C. IBBITSON 1/68

W. YOLTON

Lu 3-4

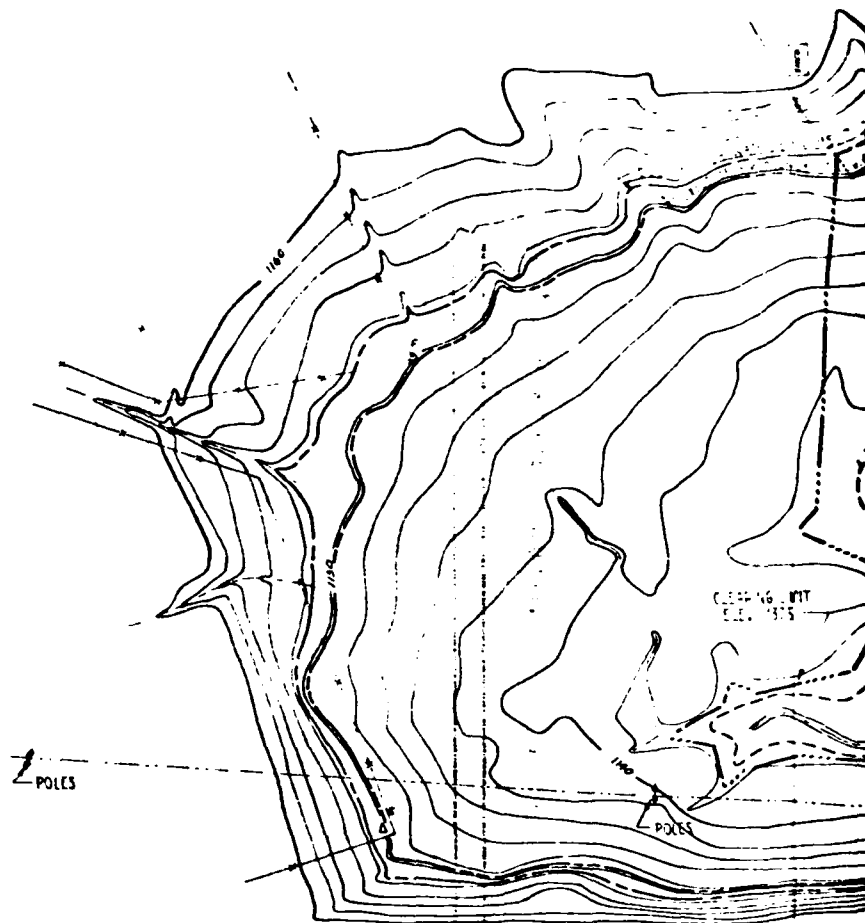
9/66

NY-2016

-P

GENERAL NOTES

- 1 AREA UNDER THE DAM AND EMERGENCY SPILLWAY AND SUPPLEMENTAL BORROW AREA TO BE CLEARED AND GRADDED. LIMITS OF AREA TO BE CLEARED AND GRADDED SHALL BE AS STAKED IN THE FIELD BY THE ENGINEER (SPEC 2A)
- 2 AREA UPSTREAM FROM DAM AND DOWN ELEVATION 1135 (MSL) SHALL BE CLEARED. LIMITS OF AREA TO BE CLEARED SHALL BE AS STAKED IN THE FIELD BY THE ENGINEER (SPEC 1B)
- 3 ALL FENCES IN WORK AREA TO BE REMOVED AS STRUCTURAL REMOVAL (SPEC 3A)
- 4 BOTTOM SECTION OF EMERGENCY SPILLWAY FROM STA 3+50 TO STA 7+50 TO BE COVERED WITH 6" OF TOPSOIL. ADDITIONAL TOPSOIL THAT IS SUITABLE FOR USE WILL BE INCORPORATED WITHIN THE SLOPES OF THE EARTH FILL AS DIRECTED BY THE ENGINEER
- 5 FILL PLACEMENT IN DKE SHALL BE IN ACCORDANCE WITH PROCEDURE ON SHEET 5 FOR THE DAM



AS BUILT

LEGEND

- CONTOUR LINES
- C. OF STREAM
- FENCELINE
- TRAVERSE LINE STATIONS
- BRUSH LINE
- WOODS LINE
- DESIGN HIGH WATER
- CREST OF EMERG. SPILL
- SLOVENT POOL
- CONSTRUCTION LIMIT
- BEN. MARK
- TEST PLOTTED & NAME
- TEST PLOTTED ONLY



0 50 100 200 FEET
SCALE

AS BUILT 12/2/68

FINCH HOLLOW, LITTLE CHOCONUT &
TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 2-A
LITTLE CHOCONUT CREEK
PLAN OF STORAGE AREA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

By: W. YOLTON	Date: 11/68	Approved By:	Date:
By: D. ANGELD	Date: 11/68	By:	Date:
By: LB	Date: 3/69	By:	Date:

NY-2016-9

2 CONTOUR 100 F.A.

CURVE DATA

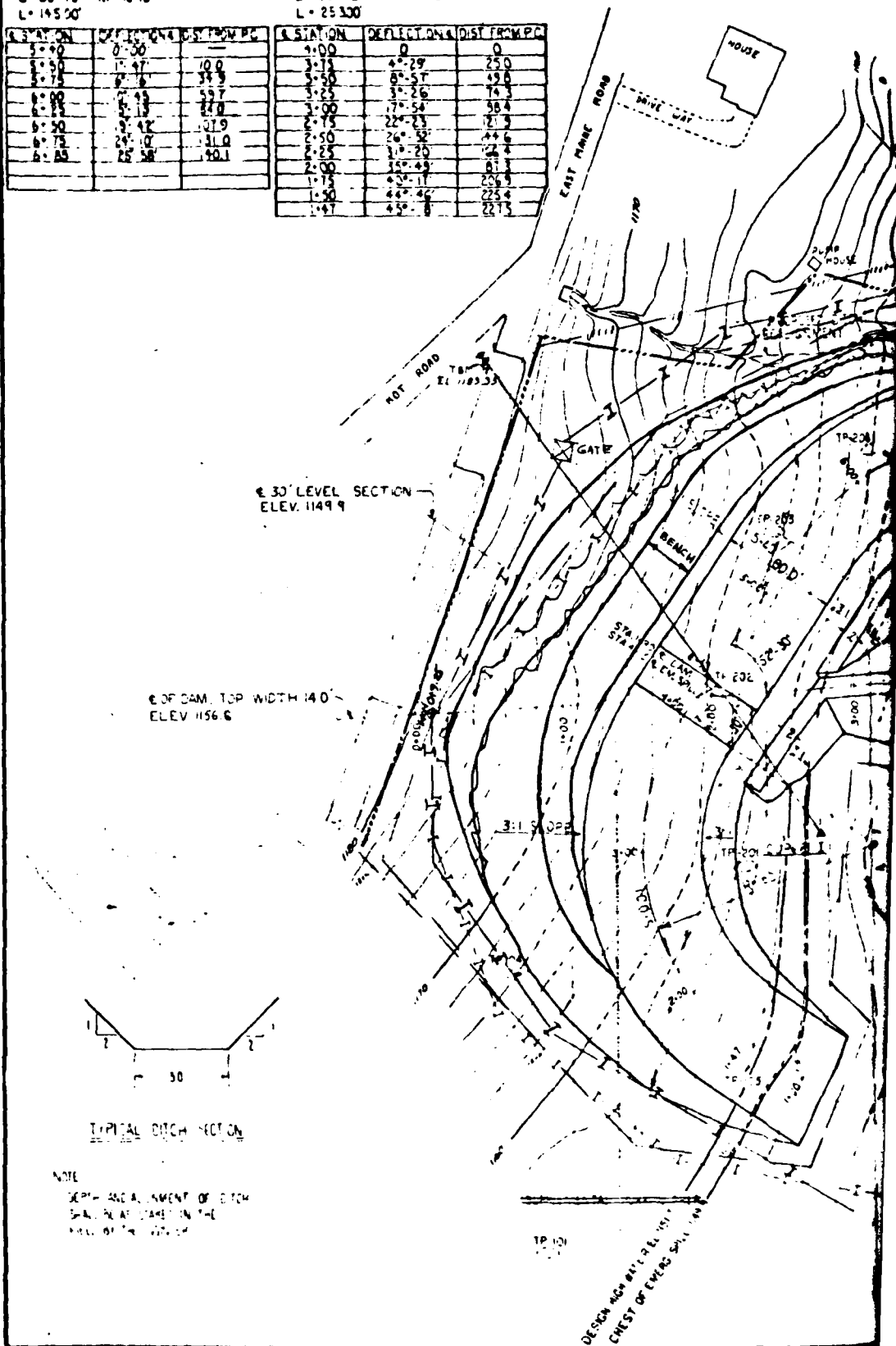
LAYOUT DATA FOR CURVE E

Δ = 51°35' T = 77.91'
R = 100.00' E = 17.96'
D = 35°49' M = 16.18'
L = 145.00'

LAYOUT DATA FOR CURVE I

Δ = 90°36' T = 161.68'
R = 100.00' E = 67.47'
D = 35°49' M = 47.46'
L = 253.00'

STATION	DEFLECTION	DIST FROM PC	STATION	DEFLECTION	DIST FROM PC
5+00	0°00'	0.0	1+00	0°00'	0.0
5+50	1°47'	10.0	1+50	4°29'	25.0
6+00	3°34'	20.0	2+00	8°57'	50.0
6+50	5°21'	30.0	2+50	13°26'	75.0
7+00	7°08'	40.0	3+00	17°54'	100.0
7+50	8°55'	50.0	3+50	22°23'	125.0
8+00	10°42'	60.0	4+00	26°52'	150.0
8+50	12°29'	70.0	4+50	31°20'	175.0
9+00	14°16'	80.0	5+00	35°49'	200.0
9+50	16°03'	90.0	5+50	40°18'	225.0
10+00	17°50'	100.0	6+00	44°47'	250.0
			6+50	49°16'	275.0



TYPICAL DITCH SECTION

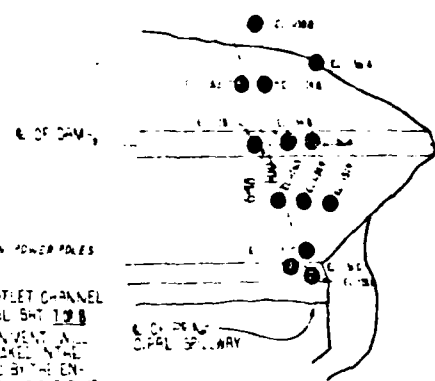
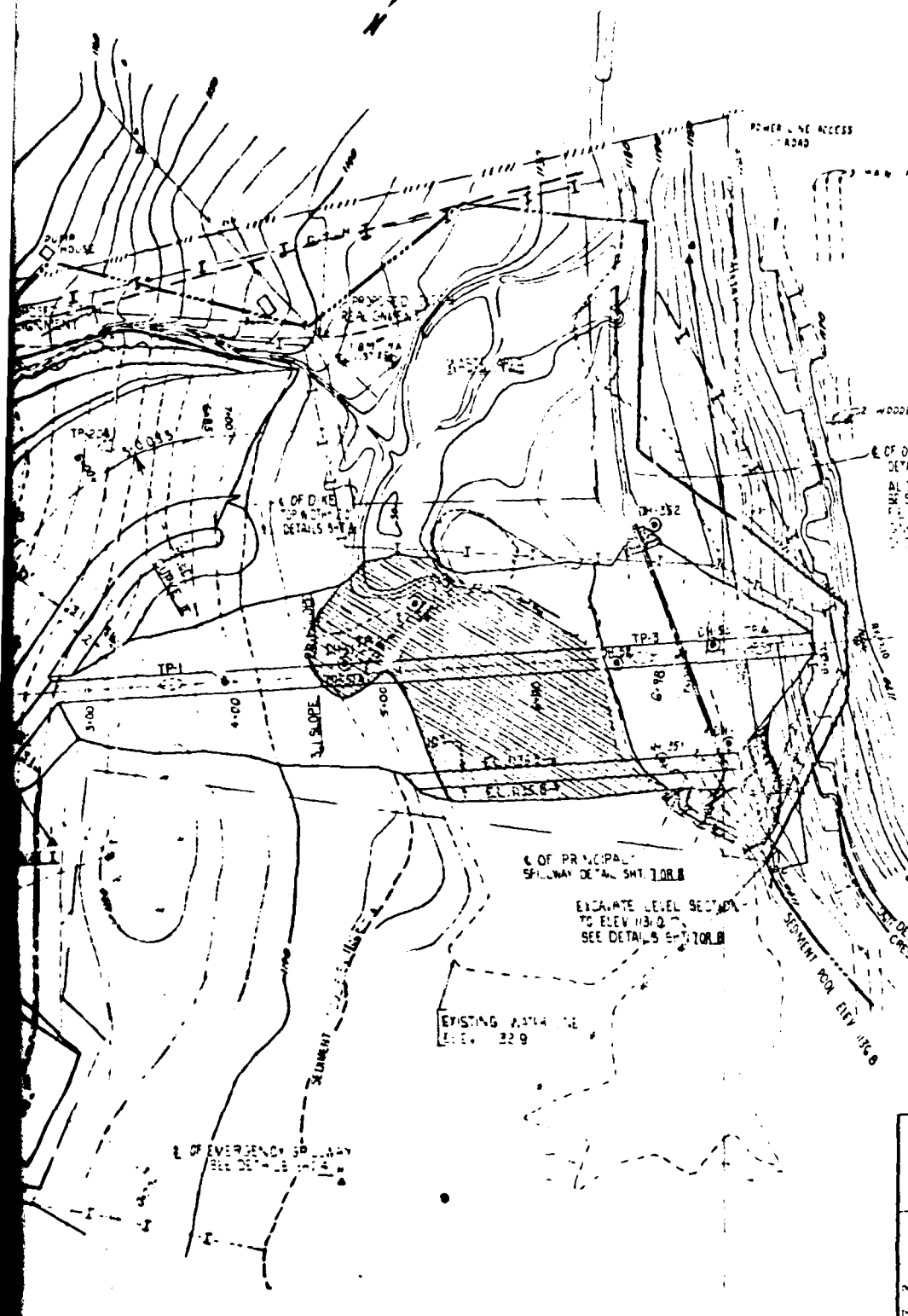
NOTE

DEPTH AND ALIGNMENT OF DITCH
SHOWN AT STATION IN THE
PLAN OF THE DITCH

AS BUILT

LEGEND

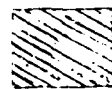
- E. OF STREAM
- FENCE LINE (EXISTING)
- CONTOUR LINES
- TRAVERSE LINE STATIONS
- SEDIMENT POOL
- CONSTRUCTION LIMIT
- FENCE OF EMERGENCY SPILLWAY
- DESIGN HIGH WATER
- BENCH MARK
- DRILL HOLES
- TEST PIT LOGGING SAMPLED
- TEST PIT LOGGED ONLY
- FENCE LINE, PLANNED



PLAN OF SUPPLEMENTAL TEST PITS

NOTE: TEST PITS DUG TO OBTAIN THE ROCK SURFACE ELEVATIONS. NO OTHER INFORMATION WAS LOGGED.

INSTRUCTIONS FOR FOUNDATION EXCAVATION

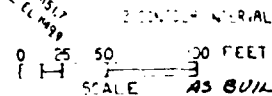


EXCAVATE EXISTING DAM AREA OF ASSURTED FILL AND SEDIMENT ACCUMULATIONS AND REPAIR FROM EXISTING DAM AREA SHALL BE AS SHOWN IN THE FIELD BY THE ENGINEER AFTER THE DRIPPING OPERATION.

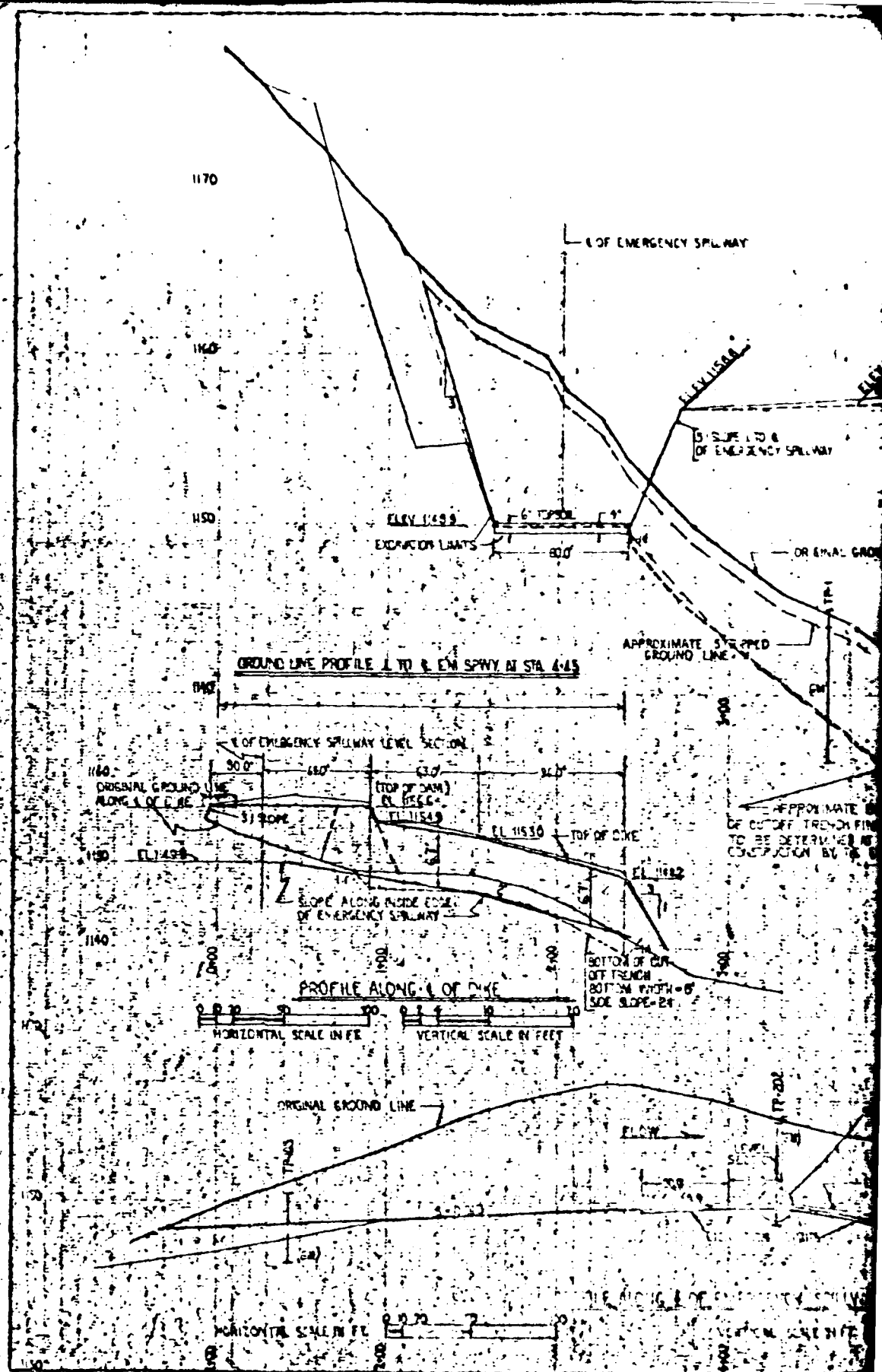
EXISTING ASPHALT ELEV. 32.9

E. OF PRINCIPAL SPILLWAY DETAIL SHT. 108B

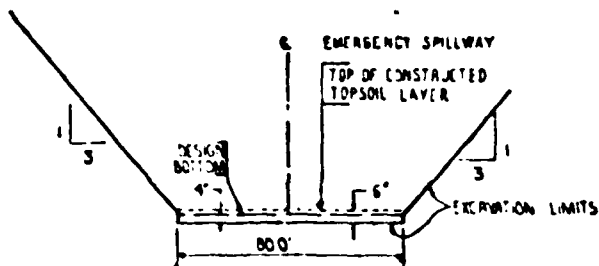
EXCAVATE LEVEL SECTION TO ELEV. 113.0 SEE DETAILS SHT. 108B



FINCH HOLLOW, LITTLE CHOCONUT & TROUT BROOK WATERSHED PROJECT	
FLOWWATER RETARDING DAM NO. 2-A	
LITTLE CHOCONUT CREEK	
PLAN OF STRUCTURAL WORKS	
U. S. DEPARTMENT OF AGRICULTURE	
SOIL CONSERVATION SERVICE	
DESIGNED BY W. H. YOLTON	DATE 1965
PROJECT NO. 165	SCALE 1" = 40'
DATE 12/8/68	BY 16
NY-2016-P	

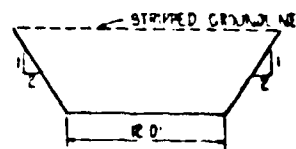


AS BUILT



SECTION OF EMERGENCY SPILLWAY AT STA. 4+15 & LEVEL SECTION

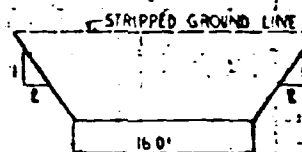
TYPICAL FROM STATION 3+50 TO STATION 7+30 EXCEPT TO DESIGN BOTTOM FROM STATION 0+80 TO 3+50 (DIME ON RIGHT SIDE EXTENDS FROM 30' UPSTREAM TO 215' DOWNSTREAM FROM & LEVEL SECTION)



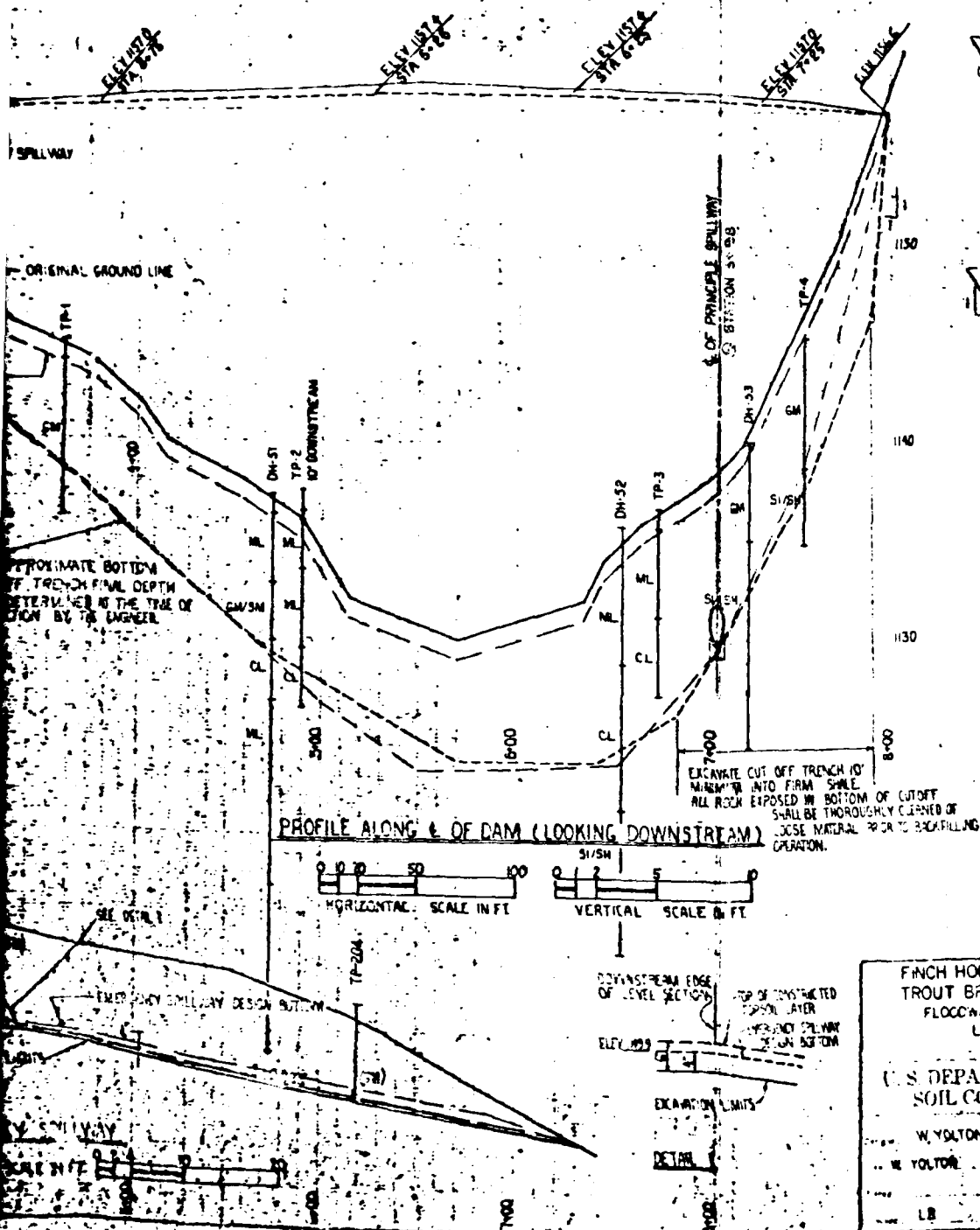
SECTION OF CUTOFF TRENCH AT STA 3+30 TYPICAL FROM STA 2+40 TO 4+50 AND STA 6+50 TO 7+37



SECTION OF CUTOFF TRENCH AT STA 4+15 TYPICAL FROM STA 4+50 TO 5+30 AND STA 6+00 TO 6+50



SECTION OF CUTOFF TRENCH AT STA 5+50 TYPICAL FROM STA 5+00 TO 6+30

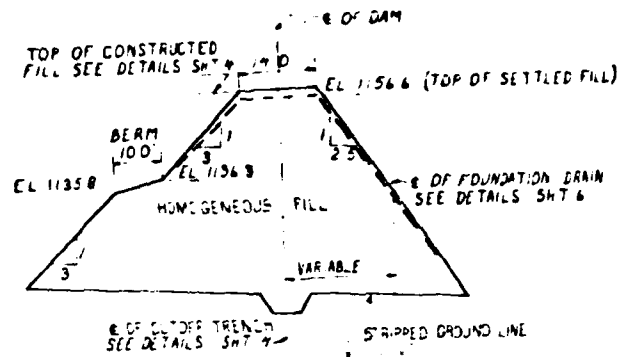


AS BUILT 12/1/68

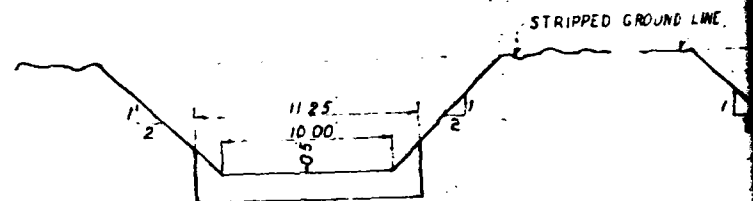
FINCH HOLLOW, LITTLE CHOCONUT & TROUT BROOK WATERSHED PROJECT
FLOODWATER PETATONG DAM NO. 2-A
LITTLE CHOCONUT CREEK
PROFILES

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

W. YOLTON	11/65	
W. YOLTON	11/65	
LB	5/66	NY-203-P

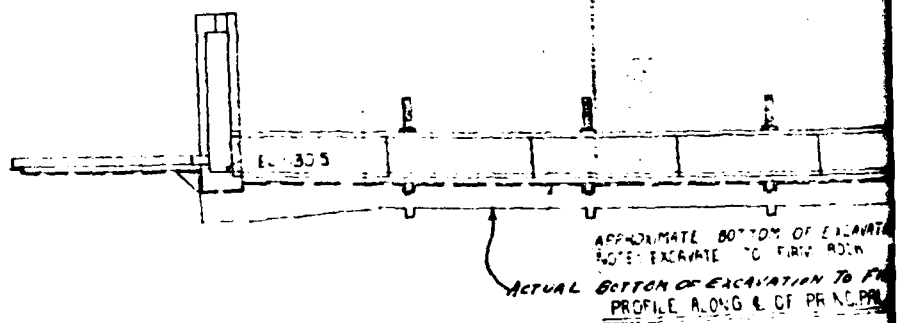


TYPICAL SECTION OF DAM
NOT TO SCALE



NOTE EXCAVATE SLOTS 1125' x 0.5'
PRINCIPAL SPILLWAY EXCAVATION AT
ANTI-SEEP COLLARS

-14.0
-11.35
-11.30
-11.25

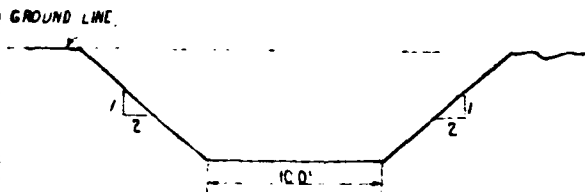


APPROXIMATE BOTTOM OF EXCAVATION
NOTE EXCAVATE TO FIRM SOIL
ACTUAL BOTTOM OF EXCAVATION TO FIRM
PROFILE ALONG E. OF PRINCIPAL

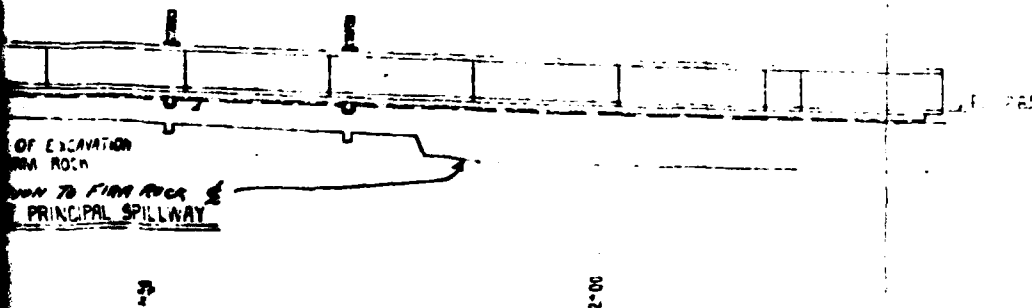
AS BUILT

EARTH FILL REQUIREMENTS					
MATERIAL	MAX ROCK SIZE	MAX LIFT ↓	REQ'D WATER CONTENT ↕	COMPACTION	
				CLASS	DEFINITION
5.1% CLAYEY GRAVEL FROM EMERGENCY SPILLWAY & SUPPLEMENTAL BORROW AREA REPRESENTED BY: TYPE 10 FROM 10' TO 90' TYPE 11 FROM 10' TO 65' TYPE 12 FROM 10' TO 40'	6"	9"	2 PERCENTAGE PTS BELOW TO 2 PER- CENTAGE PTS ABOVE OPTIMUM	A	95% MAX DENSITY BY ASTM D698, METHOD A

1. MAXIMUM LIFT THICKNESS PRIOR TO COMPACTION
 2. WATER CONTENT AT TIME OF COMPACTION
 3. FOR TYPICAL COMPACTION CURVES SEE SHEET 13
- NOTE THE FOUNDATION SURFACE THROUGH THE BASE AREA OF THE DAM SHALL BE SCARIFIED TO A DEPTH OF 6 INCHES AND COMPACTED PRIOR TO PLACEMENT OF FILL MATERIAL.



SECTION OF PRINCIPAL SPILLWAY AT STA 1+50
TYPICAL SECTION OF PRINCIPAL
SPILLWAY EXCAVATION
TYPICAL FROM UPSTREAM END OF POND DRAIN PIPE
TO END OF CONCRETE BEDDING UNDER 24" PIPE AT
THE OUTLET



AS BUILT 12/2/68
FINCH HOLLOW, LITTLE CHOCONUT &
TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 2-A
LITTLE CHOCONUT CREEK
FILL PLACEMENT & PRIN SPILLWAY EXCAV
SUPERSEMENT OF WORKED RE
SOIL CONSERVATION SERVICE

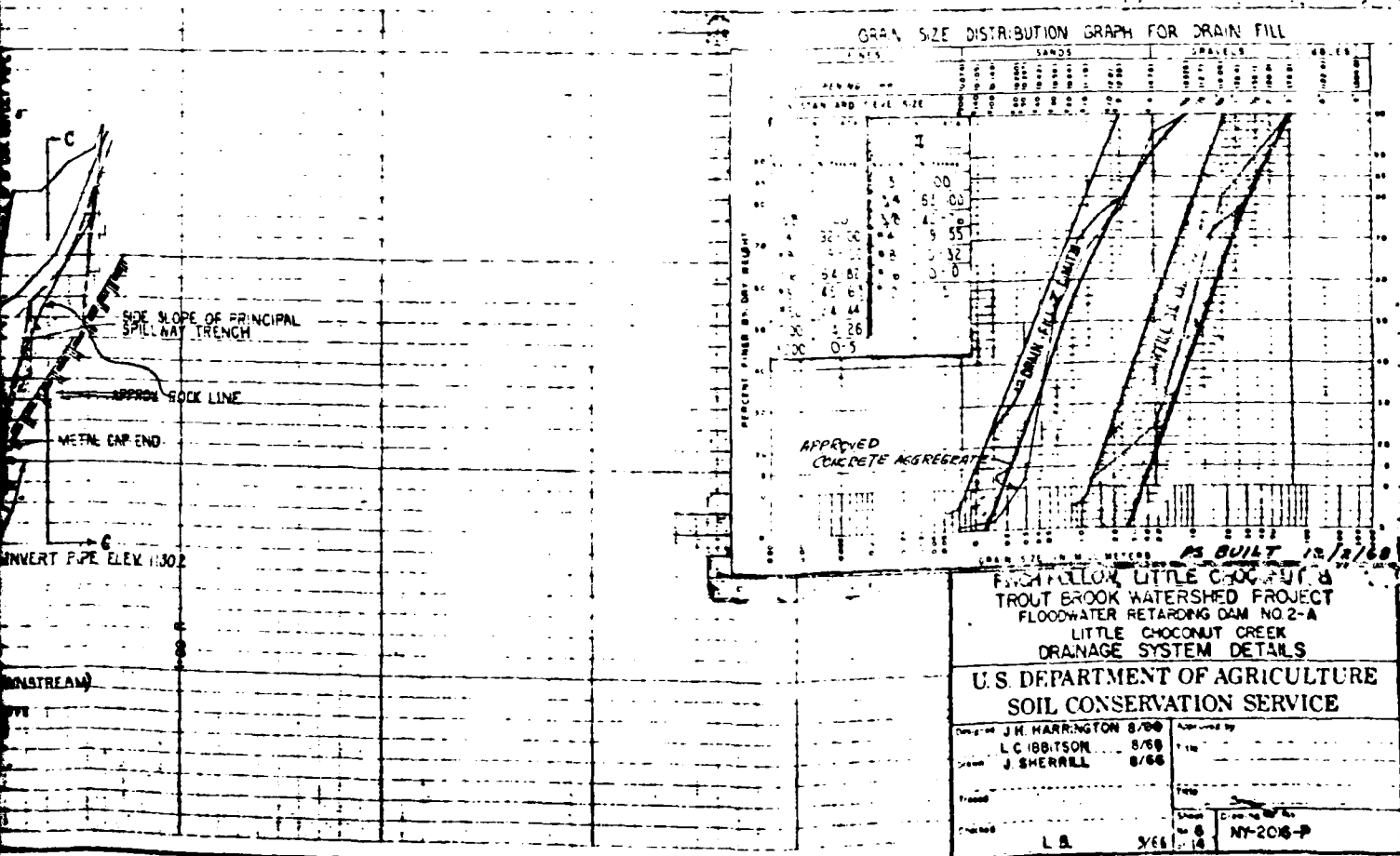
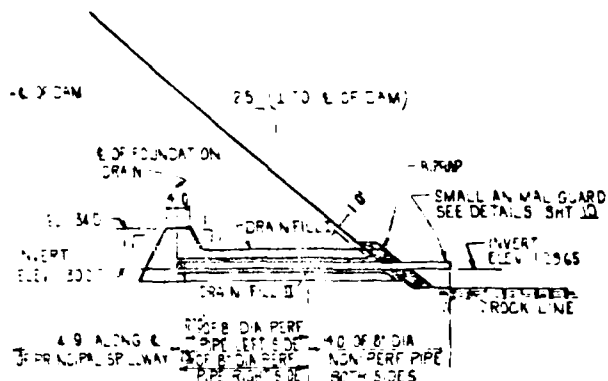
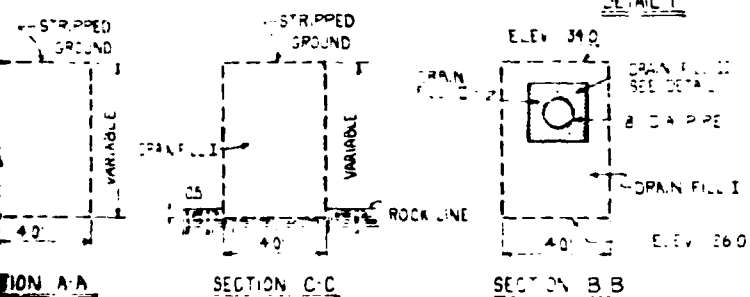
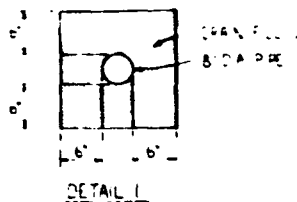
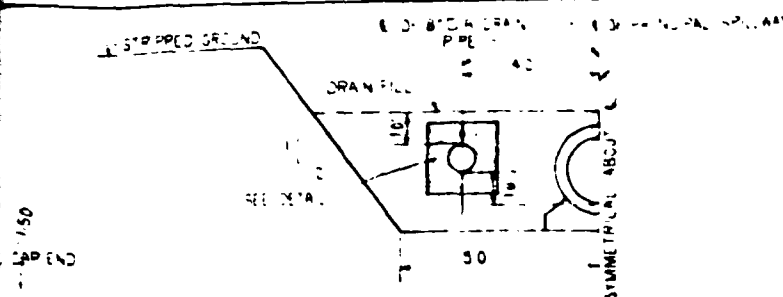
L C IBBOTSON 8/66

13 9 14 NY 2016-P

AS BUILT

DRAINAGE SYSTEM NOTES

1. DRAIN PIPES SHALL CONFORM TO SPECIFICATION 1.1 AND SHALL BE 8" DIA. SHAPE 1, CLASS 2 UNGLAZED OR GLAZED CERAMIC OR ENGLAND TYPE 2 FULLY BITUMINUS COATED PIPE.
2. THE PROFILES OF THE BOTTOM OF ALL EXCAVATIONS AS SHOWN ARE ONLY APPROX. THE REQUIRED FINISHED GRADES WILL BE ESTABLISHED IN THE FIELD AT THE TIME OF CONSTRUCTION BY THE ENGINEER.



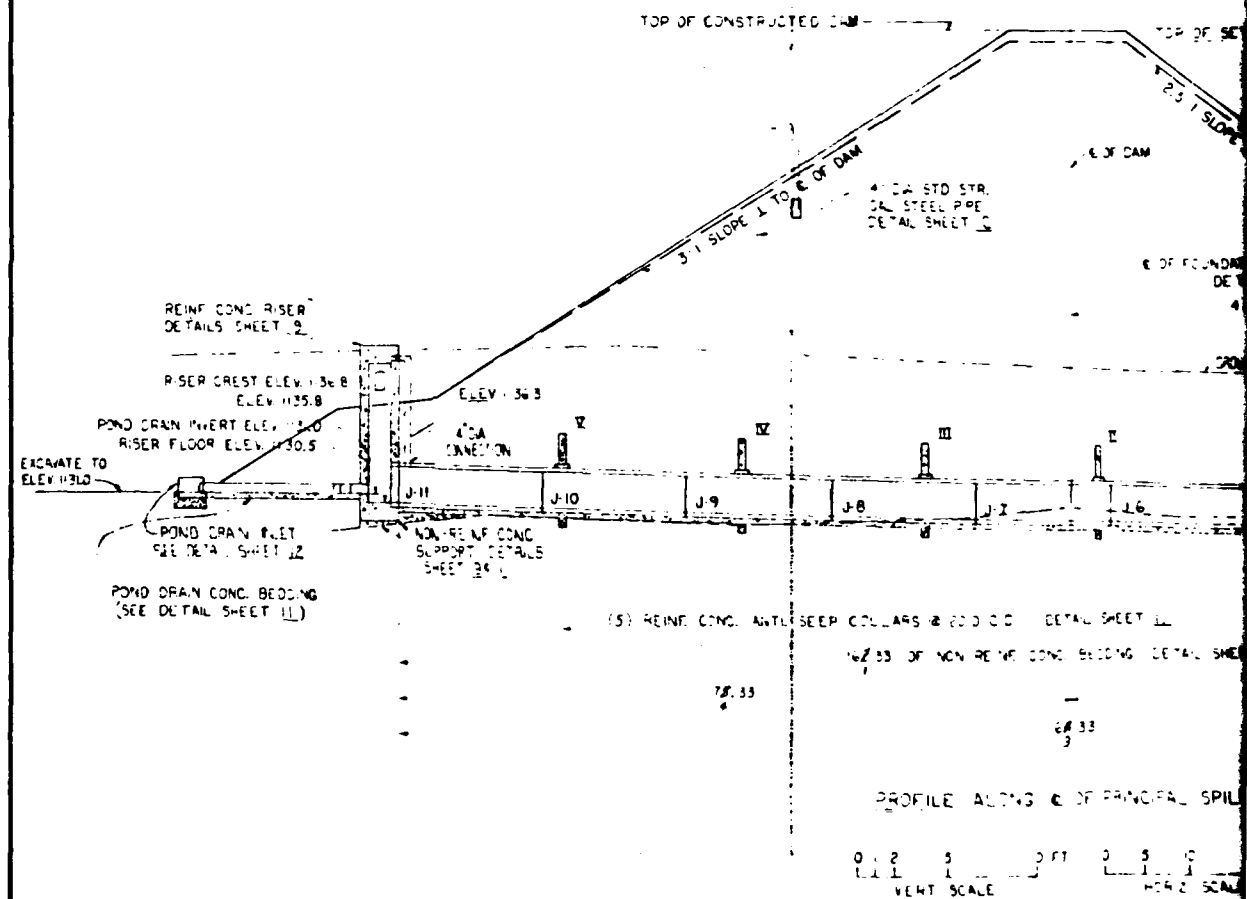
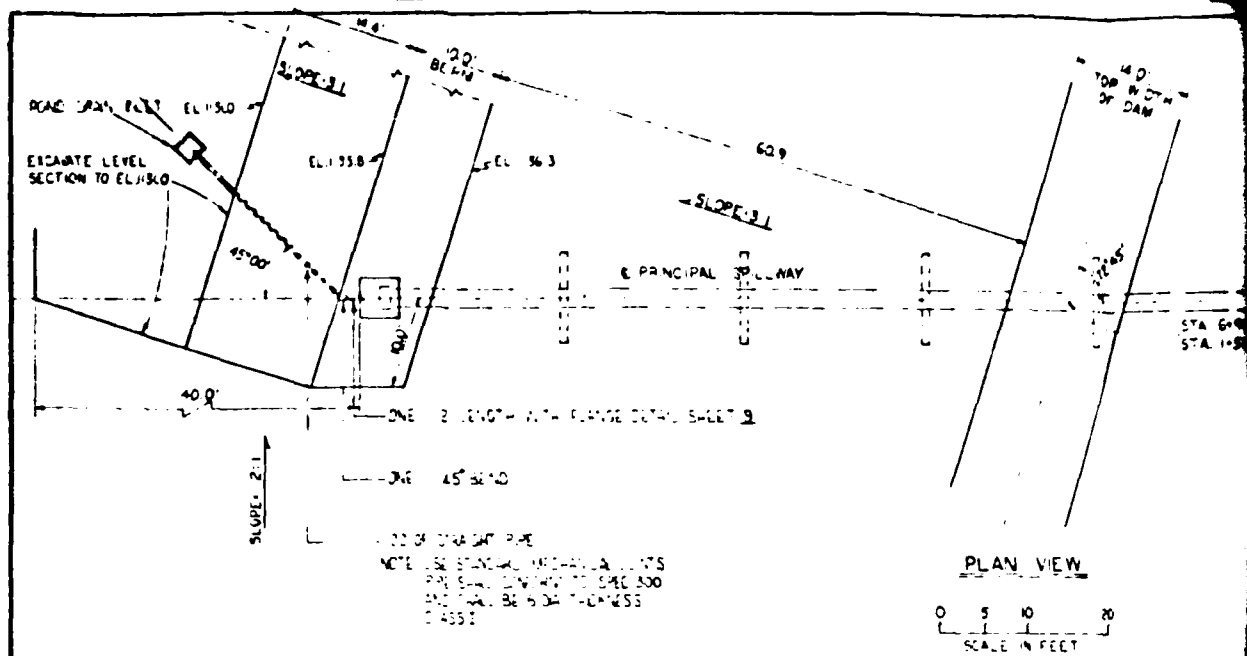
AS BUILT 12/2/60

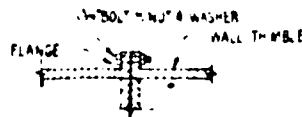
FISH FOLLO, LITTLE CHOCONUT CREEK
TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 2-A
LITTLE CHOCONUT CREEK
DRAINAGE SYSTEM DETAILS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed by J.H. HARRINGTON 8/60
Checked by L.C. IBBOTSON 8/60
Drawn by J. SHERRELL 8/60

Approved by _____
Title _____
Date _____
Scale _____
Drawing No. _____
Sheet No. 6 of 10
NY-2016-P





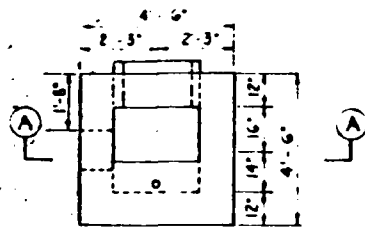
4"x6" STRUCTURAL CARBON STEEL
GRADE 50 STEEL PLATE IN WALLS IS
CONTINUOUS AROUND RISER JOINT TO
BE WELDED OR BOLTED

MANHOLE ASSEMBLY

- 1 15-29 OPENING MANHOLE COVER
MODEL R-6565-TM SERIES, MET MAN
FOUNDRY COMPANY OR APPROVED EQUIVALENT
- 2 EXPOSED HEX HEAD BOLTS
- 3 TYPE-D LIFT HANDLE
- 4 BRASS BOLTS

DETAIL 'I'

RISER CONSTRUCTION JOINT DETAIL

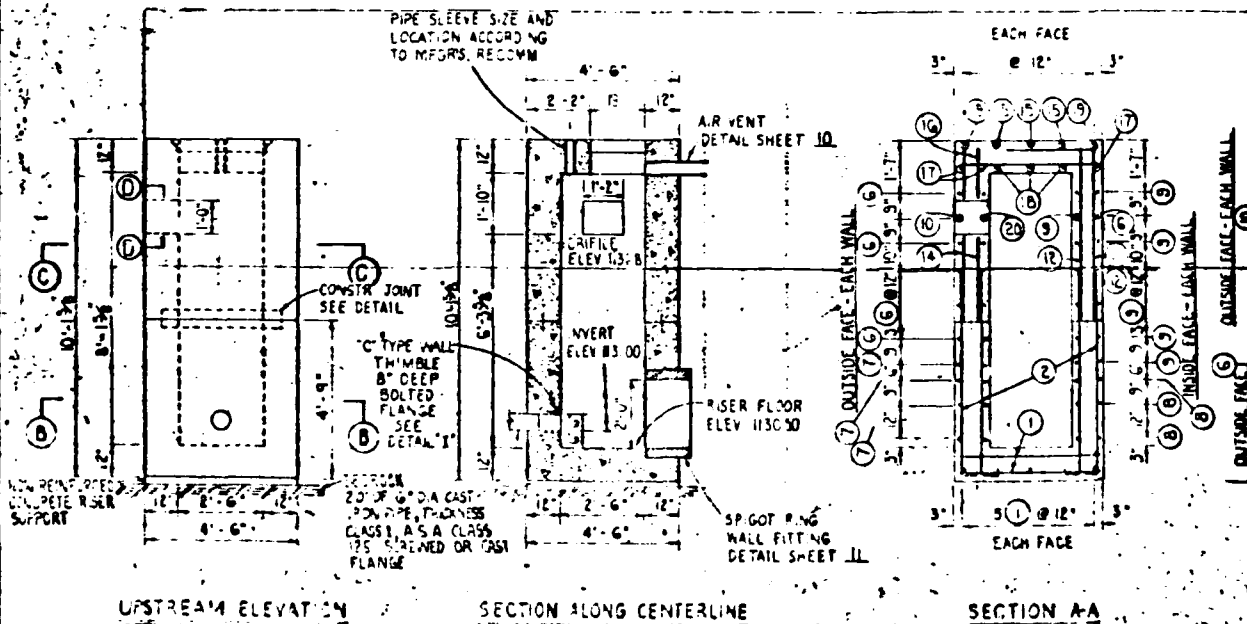


PLAN VIEW

TYPICAL SLIDE GATE NOTES

- 1 6" DIA FLAT FRAME SLIDE GATE (SEE DETAIL 10)
- 2 CLASS 150
- 3 SLIDE GATE SHALL CONFORM TO SPECIFICATION 301
AND SHALL BE TYPE W-5
- 4 'C' TYPE WALL THIMBLE 8" DEEP
- 5 PIPE SLEEVE STEM (STEM SIZES SIZED & SPACED
ACCORDING TO MANUFACTURER'S RECOMMENDATIONS
REMOVABLE LIFT HANDLE WRENCH, WRENCH SOCKET
AND TOP OF STEM LOCATED WITHIN PIPE SLEEVE)
- 6 PAINT IN ACCORDANCE WITH CONST SPEC 22
- 7 HOLES DRILLED IN BACK FLANGE OF WALL THIMBLE
BY GATE MANUFACTURER ACCORDING TO ASA CLASS
125 FLANGE SPEC

DA OF BOLT CIRCLE - 9 1/2"
NO OF BOLT HOLES - 8
DA OF BOLT HOLES - 7/8"



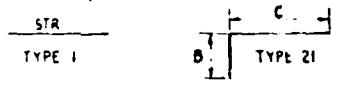
STRUCTURAL CARBON STEEL PLATE
STEEL PLATE IN WALLS TO BE
3" AND NO RISER JOINTS TO BE
BOLTED

AS BUILT

STEEL SCHEDULE

MARK	STEEL	20 QUANTITY	LENGTH	TYPE	B	C	TOTAL LENGTH
1	5	20	4.0				80.0
2	5	22	6.8	21	6.1	0.7	155.8
3	5	2	1.7	21	1.0	0.7	35.8
4	5	2	4.0				8.0
5	5	10	2.0				20.0
6	5	10	5.0	21	2.11	2.4	115.0
7	5	6	7.0	21	2.11	4.1	42.0
8	5	6	3.9				22.6
9	5	15	3.6				54.0
10	5	2	4.1	21	2.11	1.3	9.4
11	5	6	5.0	21	5.2	2.0	45.0
12	5	2	5.3				10.5
13	5	8	2.3				18.4
14	5	2	2.4				4.8
15	5	3	6.11	21	5.2	1.4	28.8
16	5	2	1.6				3.0
17	5	6	4.0				24.0
18	5	3	1.5				4.5
19	5	4	4.5	21	2.11	1.6	17.8
20	5	2	1.0				2.0

BAR TYPES

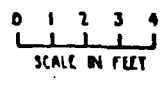


RISER QUANTITIES

STEEL
NO. 5 BAR ----- 835.4 N. FT. ----- 87 LBS
TOTAL ----- 87 LBS
CONCRETE
REINFORCED ----- 57 CU YDS

CONSTRUCTION DETAILS

1. ALL DIMENSIONS ARE MEASURED TO THE OUTSIDE EDGE OF ALL BENDS.
2. RADIUS OF BENDS EQUALS 3 BAR DIAMETERS.
3. ALL REINFORCING STEEL PLACED IN CONCRETE POURED AGAINST THE FORMS SHALL HAVE A MINIMUM OF 3" CLEAR COVER.
4. ALL REINFORCING STEEL PLACED IN CONCRETE POURED IN FORMS SHALL HAVE A MINIMUM OF 2" CLEAR COVER.
5. ALL FINISHED EDGES OF CONCRETE TO HAVE A 3/4" CHAMFER UNLESS OTHERWISE NOTED.



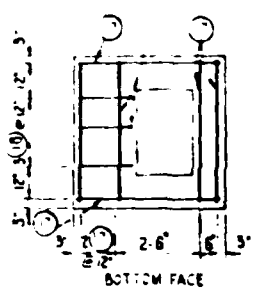
AS BUILT 12/2/68

FINCH HOLLOW, LITTLE CHOCONUT &
TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO. 2-A
LITTLE CHOCONUT CREEK
RISER STRUCTURAL DETAILS

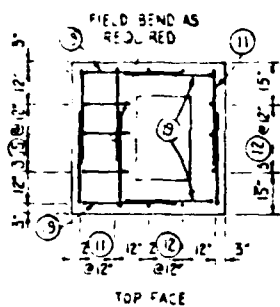
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

D. ZOGRAFOS
W. YOLTON
L. B.
Approved by
Checked by
NY 2019-P

FIELD BEND AS REQUIRED

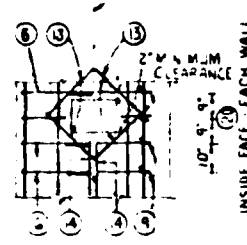


BOTTOM FACE



PLAN VIEWS

SYMMETRICAL ABOUT C

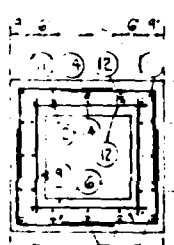


SECTION D-D

OUTSIDE FACE - EACH WALL

INSIDE FACE - EACH WALL

INSIDE FACE



OUTSIDE FACE

INSIDE FACE EACH WALL

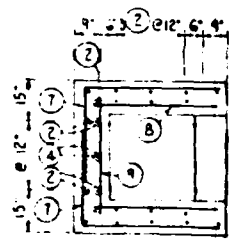
OUTSIDE FACE

INSIDE FACE

OUTSIDE FACE - EACH WALL

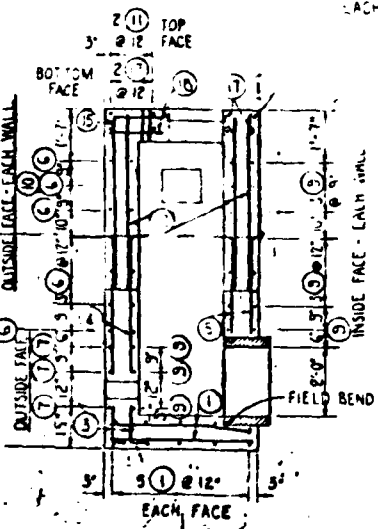
SECTION C-C

INSIDE FACE - EACH WALL

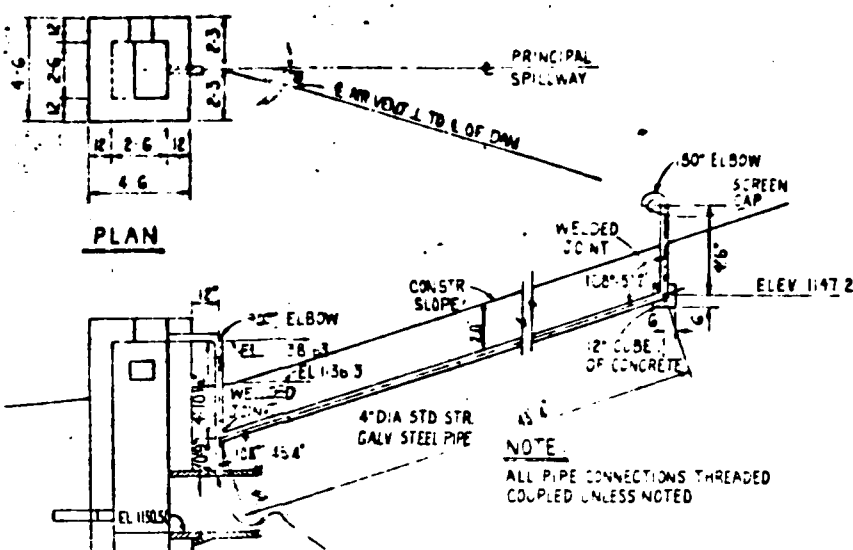


OUTSIDE FACE - EACH WALL

SECTION B-B



SECTION ALONG CENTERLINE



SECTION ON E

AIR VENT DETAILS
(NOT TO SCALE)

WELDING DETAILS

NOTE:
ALL POINTS OF
IRONS TO BE WELDED
ENTIRE TRASH
IN ACCORDANCE WITH

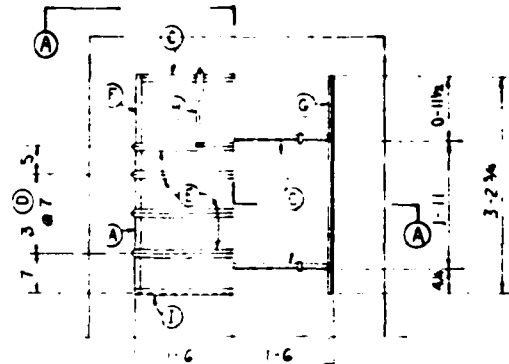
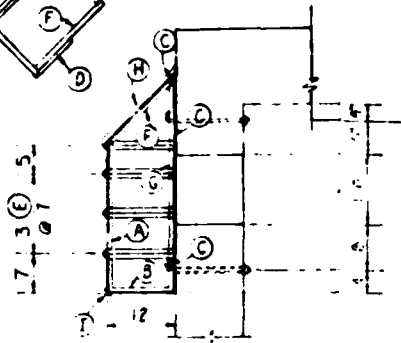
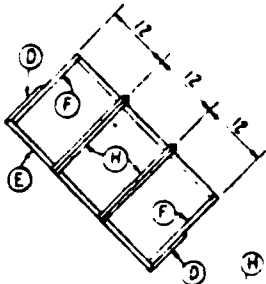
NOTE:
ALL PIPE CONNECTIONS THREADED
COUPLED UNLESS NOTED

FOR METER CONNECTION FABRICATE INTO
CONCRETE WATER PIPE ACCORDING TO
MANUFACTURERS RECOMMENDATION

ISOMETRIC

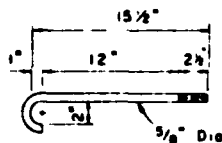
WELDING DETAILS

ALL POINTS OF CONTACT BETWEEN ANGLE
TO BE WELDED.
ENTIRE TRASH RACK TO BE GALVANIZED
ACCORDANCE WITH SPEC. 119



RISER TRASH RACK DETAILS

(NOT TO SCALE)



"HOOK" BOLT

Supply With Hex Nut And Washer

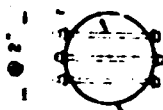
BILL OF MATERIAL

LOCATION	ITEM	SIZE	LENGTH	QUANTITY
TPASH RACK	ANGLE IRON	2" x 2"	2'-2 1/4"	2
			1'-0"	2
			2'-11 1/2"	3
			1'-0 3/4"	8
			3'-1 1/2"	4
			1'-5"	2
			3'-2 3/4"	2
			1'-0 3/4"	2
			3'-0"	1
		5/8" DIA	1'-0"	4
AIR VENT	ROCK BOLTS - 1/2" x WASHER GALV	1/2" DIA	1'-3 1/4"	4
	GAL STD STR P PPE	4" DIA	55'-5/2"	-
	180° ELBOW, GALV	4" DIA	-	1
	90° E. BOW, GALV	4" DIA	-	1
	CAP. SCREEN, GALV	4" DIA	-	1

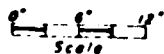
3/8" Dia Bolts
w/ Hex Nut And Washers
9" Long

1 1/2"

Drill 1/2" Dia
Holes



SMALL ANIMAL GUARD DETAILS



AS BUILT 12/2/68

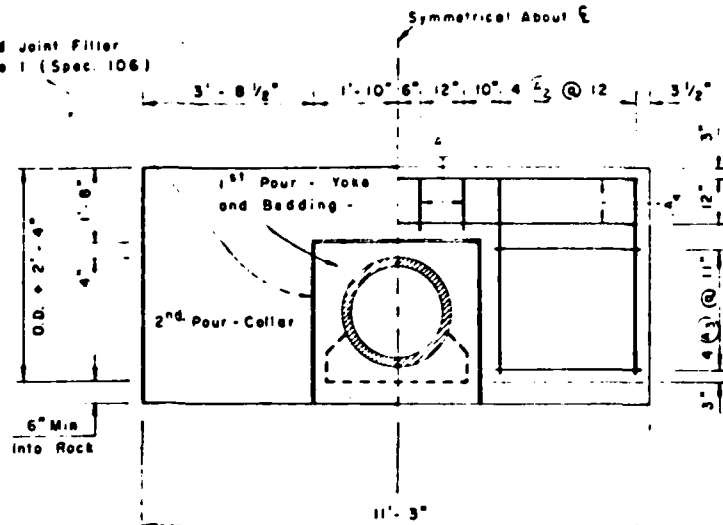
FINCH HOLLOW, LITTLE CHOCONUT &
TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 2-A

TRASH PAIL, VENTING TUBE AND ANIMAL GUARD

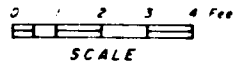
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

18 9/66 10 14 NY-2016-F

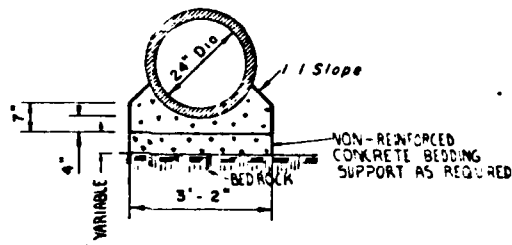
1/2" Preformed Joint Filler
18" Wide, Type 1 (Spec. 106)



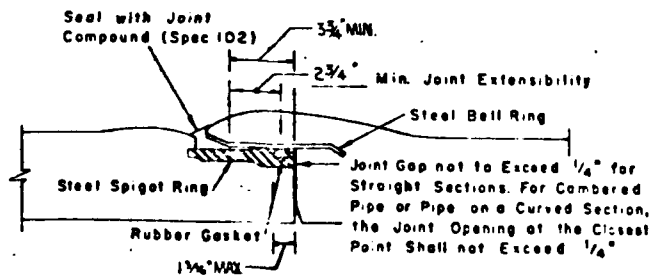
REINFORCED CONCRETE ANTI-SEEP COLLAR



5 - Req'd



CONCRETE BEDDING (NON-REINFORCED CONCRETE)



REINFORCED CONCRETE WATER PIPE JOINT



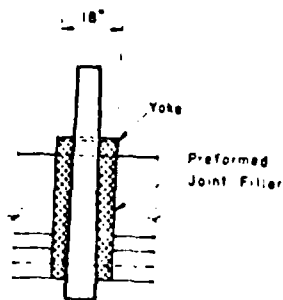
BAR TYPE

Length ①

AS BUILT

ANTI-SEEP COLLAR STEEL SCHEDULE

Mark	Size	Length	Type	Quan	Co. or	Qty	Quan	Co. or	Qty	Length
A-1	4	1-3		4		20				25'-0"
A-2	4	4-5		8		40				170'-0"
A-3	4	3-5		8		70				150'-0"
A-4	4	10-9		2		10				107'-6"



TOTAL QUANTITY FOR COLLARS CRADLE, BEDDING AND SUPPORT

STEEL

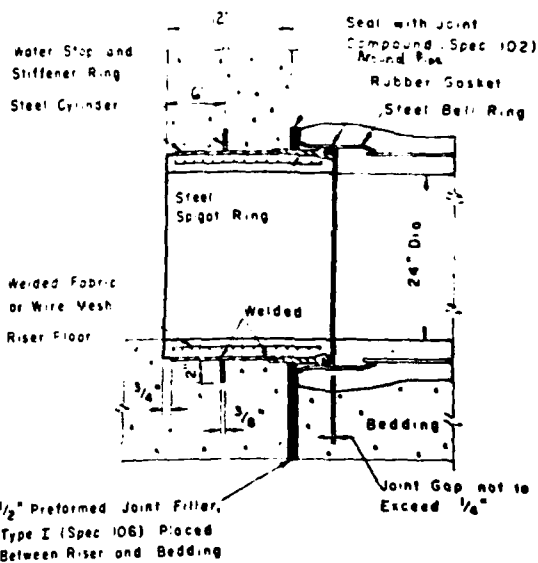
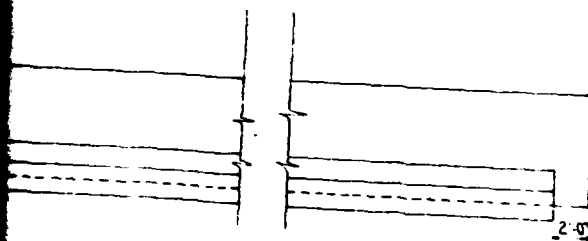
No. 4 Bar 432.5 * 288.91 Lbs

CONCRETE

REINFORCED 37.0 YDS
NON REINFORCED 37.0 YDS

P COLLAR

5 - Req'd



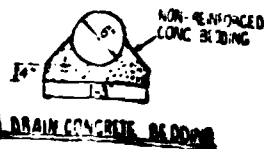
SPIGOT RING WALL FITTING

AS BUILT 12/1/68

FINCH HOLLOW, LITTLE CHOCONUT &
TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 2-A
LITTLE CHOCONUT CREEK
COLLAR, BEDDING & MISC DETAILS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

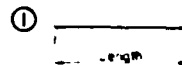
Designed by L. C. BRITTON	Date 8/68	Approved by
Drawn by T. B. Gentry, Jr.	Yds.	
Typed	Yds.	
Checked by L.B.	Sheet 11 of 14	NY-206-P



POND DRAIN TRASH RACK BILL OF MATERIALS			
ITEM	SIZE	LENGTH	QUANTITY
Angle iron	1/2" x 3/4"	1'-10"	2
	1/2" x 3/4"	1'-5"	4
	1/2" x 3/4"	1'-10"	4
Steel plate	1/2" Dia	2'-4"	6
	1/2" Dia	1'-5"	2
	1/2" Dia	2'-0"	5
Anchor Bolt	1/2" Dia	2'-8"	6

POND DRAIN STEEL SCHEDULE				
MARK	QUAN	SIZE	LENGTH	TOTAL LENGTH
7-1	8	4	2'-0"	16'00

BAR TYPES



POND DRAIN INLET QUANTITIES

STEEL

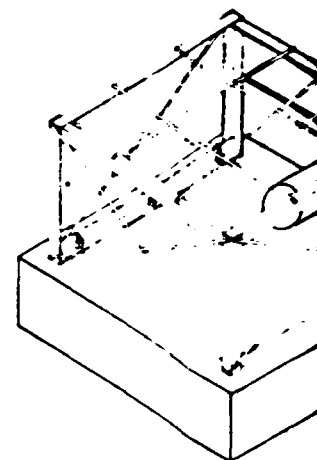
No. 4 Bar 16.0 Lb Ft 10.7 Lbs

CONCRETE

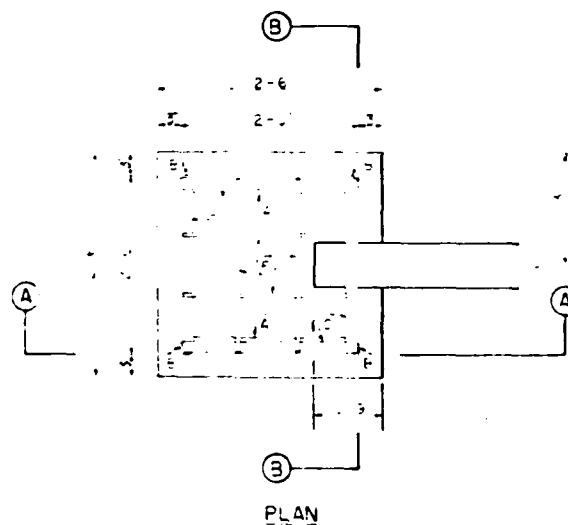
Reinforced 0.17 Cu Yds

CONSTRUCTION DETAILS

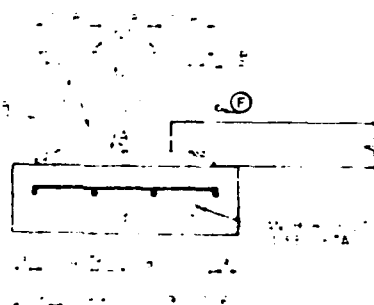
1. All points of contact between angles and between reinforcing bars and angles to be welded.
2. Material in pond drain trash rack shall conform to Spec 117 for structural carbon steel plates, shapes and bars.
3. Trash rack shall be painted in accordance with Spec 22.



ISOMETRIC
NOT TO SCALE



PLAN

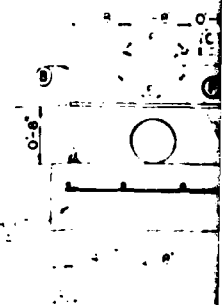


SECTION A-A

ANCHOR BOLT DETAIL

NOT TO SCALE

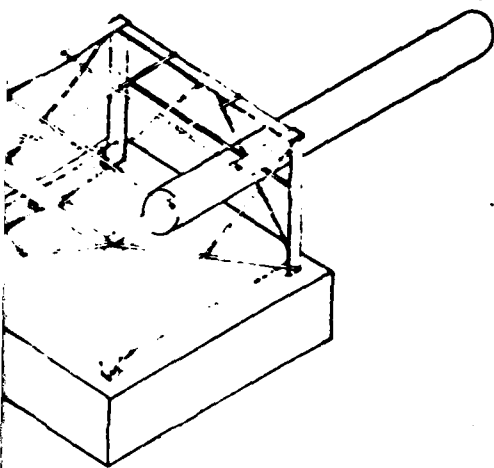
Struct. Steel Class 308, 1038
16, Condition 2
Supply with Hex Nut and Washer



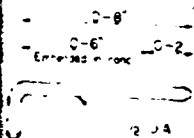
SECTION B-B

SCALE 1/4" = 1'-0"

AS BUILT

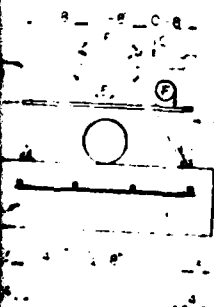


ISOMETRIC
NOT TO SCALE



ANCHOR BOLT DETAIL
NOT TO SCALE

Use Steel Class 308, 7035c or
16, Conductor 21
Bolt with Hex Nut and Washer



SECTION B-B

ANGLE IRON (A)
NOT TO SCALE

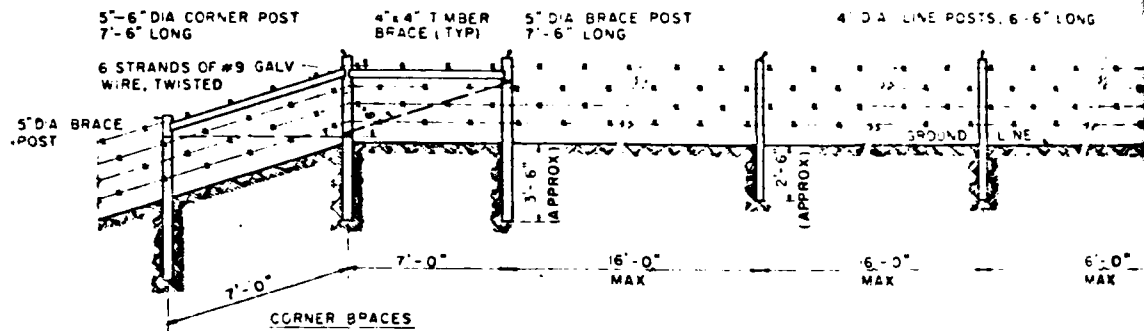
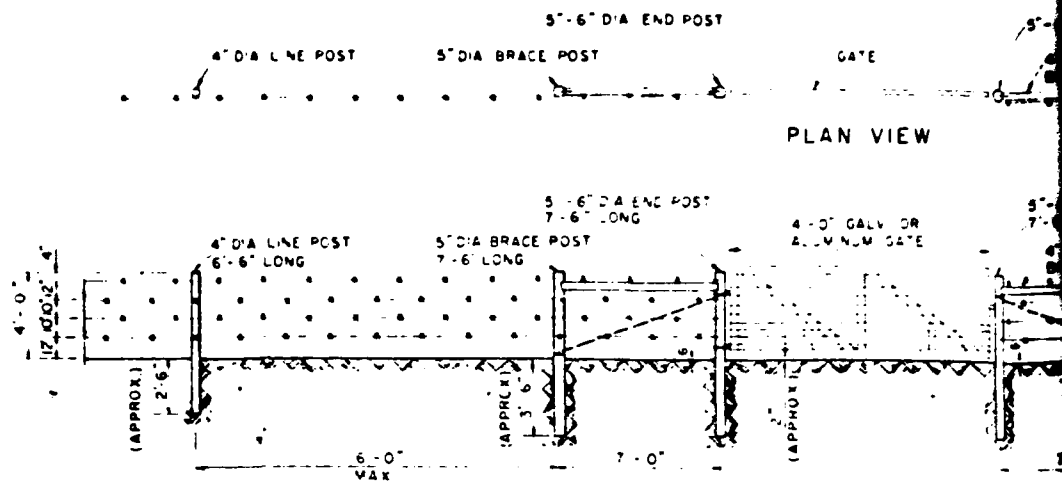
AS BUILT 12/2/60

FINCH HOLLOW, LITTLE CHOCONUT &
TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 2-A
LITTLE CHOCONUT CREEK
POND DRAIN INLET DETAILS

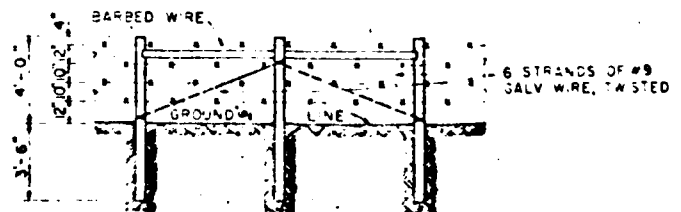
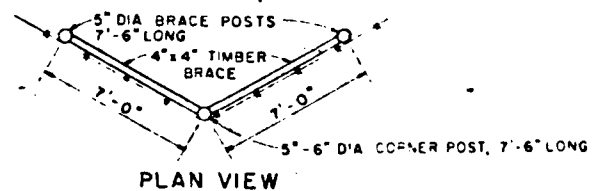
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

AV. 10.00
A.E. 12.00

12
16



DETAIL OF 4-STRAND BARBED WIRE

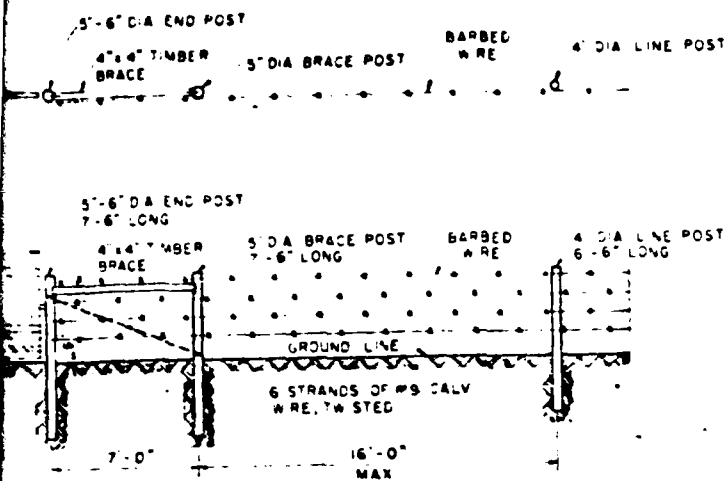


TYPICAL CORNER AND DIRECTION CHANGE BRACING

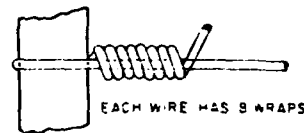
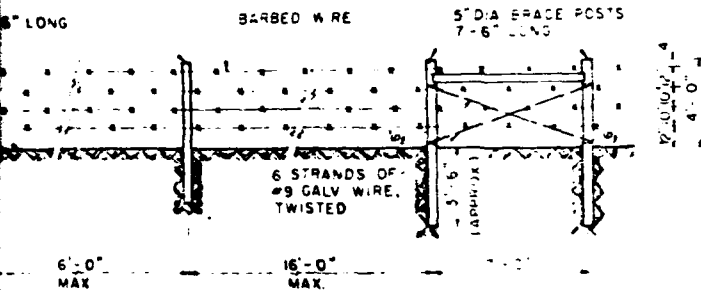
AS BUILT

CONSTRUCTION DETAILS

- 1 BRACE POSTS, MAXIMUM SPACING 7'-0" CENTER TO CENTER
- 2 LINE POSTS, MAXIMUM SPACING 6'-0" CENTER TO CENTER
- 3 STEEL POSTS MAY BE SUBSTITUTED FOR LINE POSTS
- 4 NOTCH POSTS 3/4" FOR TIMBER BRACE
- 5 THE TOPS OF ALL POSTS SHALL HAVE THE MINIMUM DIAMETER IN INCHES SHOWN ON THE PLANS
- 6 BARBED WIRE SHALL BE GALVANIZED STEEL, 12 1/2" GAUGE, WITH 4 POINT ROUND BARBS SPACED APPROX 5 INCHES APART
- 7 OVERSIGHTS FOR WOOD PRESERVATIVE SHALL BE USED



TION



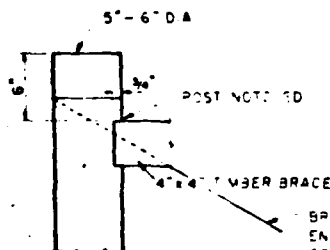
1/2 WESTERN UNION SPlice
(AT END AND GATE POST)

BARBED WIRE FENCE



FULL WESTERN UNION SPlice

WIRE SPlicing DETAIL



POST DETAIL

BRACE WIRE SHALL COMMENCE AND END WITH AT LEAST ONE AND A HALF COMPLETE TURNS AROUND THE POST AND SHALL BE SECURELY STAPLED TO THE BACK OF THE POST. BRACE WIRES SHALL BE TWISTED AT THEIR MID POINTS TO MAKE THE ASSEMBLY RIGID.

AS BUILT 12/2/68

FINCH HOLLOW, LITTLE CHOCONUT & TROUT BROOK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 2-A
LITTLE CHOCONUT CREEK
FENCE DETAILS

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

AM A ALLABAND
W H MORGAN
C B FORD

NORMAN B WILSON

NY-2016-P